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Our team is particularly known for its ability to integrate financial and strategic analysis with facilitation and consensus-building processes to develop effective strategies and solutions to complex problems across a wide range of policy, fiscal, and organizational issues.

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COLORADO PUBLIC HEALTH SYSTEM TRANSFORMATION
Core Public Health Services Needs Assessment Report

Prepared by:
Habile Consulting LLC

January 2020

Acknowledgements

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This report was prepared for CALPHO, under the advisement and review of the CDPHE Leadership Team, CALPHO Public Health System Transformation Committee, and the Colorado Public Health System Transformation Steering Committee.

Full acknowledgments follow.
COLORADO PUBLIC HEALTH SYSTEM TRANSFORMATION POLICY PROCESS

Colorado’s public health system transformation work is being led by an impressive group of state and local public health leaders from throughout Colorado, who are working together through several teams and committees to advance transformation efforts. These policy bodies have been instrumental in the design, development, and execution of the CPHS Needs Assessment. The Project Management Team, CDPHE Leadership Team, CALPHO Public Health System Transformation Committee, and Colorado Public Health System Transformation Steering Committee have all made valuable contributions to this work providing important review based on each of their unique perspectives.

We are deeply grateful to everyone who has contributed to this Needs Assessment.
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Assessment Participants

This Core Public Health Services Needs Assessment was made possible by the participation of Colorado’s 54 governmental public health agencies, including the Colorado Department of Public Health and Environment (CDPHE) and 53 local public health agencies, as well as close governmental partners Denver Public Health and Northwest Colorado Health.

In all, over 259 LPHA and CDPHE staff are known to have directly participated in the Needs Assessment Data Collection process; if we were to consider all of the people within LPHAs who answered questions or provided data for this purpose, that number might be much higher. These staff worked tirelessly within their already constrained capacity and schedules, to provide detailed agency-level data to inform this needs assessment. A full list of known participants is provided in Appendix A: Acknowledgments: Data Collection and Validation Process Participants.

More information about participating governmental public health agencies’ efforts related to this needs assessment is available in Appendix D: Data Collection and Validation Process Methodology.

We are deeply grateful to everyone who participated in the Needs Assessment data collection process.
Recognizing that the CPHS Needs Assessment is of interest to a broad audience, with varying needs, we have developed a flexible product that nests. Readers should select the version of the report that provides results and findings at the appropriate altitudes to meet their needs. The available report versions are described, below, and outlined in the graphic to the right:

- **Executive Summary.** The Executive Summary is designed to be self-contained, such that all acronyms/abbreviations, glossary terms, and sources are provided in text or as footnotes.
- **Overall Report.** The Overall Report includes the Executive Summary as well as the main report which describes the background, methods, overall, system-level results, and a robust discussion of the results of this effort. This report version should be published with the appendices.
- **Detailed Report.** The full, detailed report augments the Overall Report by providing additional results at both a foundational capability/service and function- and agency-level. Like the Overall Report, this version should be published with the appendices.

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Our individual health, and the health of our loved ones, is fundamental to our quality of life. In 2015 (the most recent year for which data is currently available), the US spent significantly more on health care (as a percentage of Gross Domestic Product) than other peer, industrialized nations, yet achieved markedly lower health outcomes, including shorter life expectancy.\(^1\) This imbalance is so critical, that it is reflected in Governor Polis’ “Bold Four” initiatives and is explicitly identified as the key “wildly important priority” within that initiative: “Save Coloradan’s money on health care.”\(^2\)

Implicit in Governor Polis initiative, is the need to continue to improve health outcomes while reducing health care spending. This is an especially difficult challenge, as US life expectancy, including in the state of Colorado, is facing its longest sustained decline since World War I.

This trend, if left unchecked, means that today’s children are in danger of becoming the first generation in American history to live shorter, less healthy lives than their parents. The Centers for Disease Control and Prevention believes this trend is largely driven by deaths from drug overdose and suicide, of particular concern to Colorado as deaths owed to drug misuse, alcohol, and suicide outpace the US overall.\(^3\)

A goal to improve health outcomes while also reducing health care spending would seem to be particularly challenging and possibly working at cross purposes. One path to bridging this apparent divide could be increased investment in public health.

There is overwhelming evidence that properly funded public health programs are a cost effective approach to systematically improving the overall health outcomes of communities.

Programs and services that focus on disease and injury prevention, reducing exposure to environmental and health hazards, and the promotion of health are proven to reduce health care costs. In fact, a 2017 study conducted a systemic review of return on investment of public health interventions research and found that investment in public health activities in high-income countries had a median return of 14 to 1\(^4\).

Public health work is complex and multi-sectoral, bridging policy around health, environment, and social determinants like economic development, education, housing, human services, land use and planning, and transportation, among others. Such work can be hard to define and a “black box,” as the activities are extremely broad while also often being intangible or hard for the residents who benefit from them to see.

When you receive clinical health care services, they are generally a direct, individualized service, and you typically understand the services provided (that is, what you’re paying for); the same is not true for public health services which are often enabling or indirect, population-based services that are delivered to the population. For these reasons, public health activities are often taken for granted, by both policy makers and the general public, leading to chronic underfunding, unpredictability, and insecurity of funding.

**Colorado’s Public Health System Transformation Initiative**

In an effort to reverse declining health outcomes while reducing health care costs across Colorado, the governmental public health system in Colorado seeks to systemically enhance public health services in Colorado. To do this, the Colorado Association of Local Public Health Officials (CALPHO) and CDPHE (Colorado Department of Public Health and Environment) are developing a roadmap for public health system transformation in Colorado and have identified the Foundational Public Health Services (FPHS) framework as the best model for Colorado’s effort.

FPHS are a minimum package of foundational

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\(^1\) [https://ourworldindata.org/the-link-between-life-expectancy-and-health-spending-us-focus](https://ourworldindata.org/the-link-between-life-expectancy-and-health-spending-us-focus)

\(^2\) [https://dashboard.state.co.us/bold4-health.htm](https://dashboard.state.co.us/bold4-health.htm)

\(^3\) [https://www.tfh.org/state-details/colorado/](https://www.tfh.org/state-details/colorado/)


capabilities and services that represent a subset of all public health services and focus on activities that: (1) must be available to all people served by the governmental public health system; and, (2) meet one or more of the following criteria:

- Services that are mandated by federal or state laws.
- Services for which the governmental public health system is the only or primary provider of the service statewide.
- Population-based services (versus individual services) that are focused on disease prevention and protection and promotion of health.

More information on the national FPHS framework is available [here](https://phnci.org/national-frameworks/fphs).

The first step in this process was to align the CPHS, as codified by the Colorado Public Health Reauthorization Act (SB 08-194) (2008 Public Health Act), with the FPHS framework. Colorado's CPHS framework already included over 75% of the national FPHS model components. Colorado's governmental public health system elected to maintain the terminology in Colorado's Public Health Act while expanding the concept of the Core Public Health Services to align to the FPHS framework.

Exhibit ES - 1 shows the resulting Colorado CPHS framework.
A. FOUNDATIONAL CAPABILITIES

1. Assessment and Planning
   a. Data Collection and Distribution
   b. Data Access, Analysis and Interpretation
   c. Health Assessment Development, Implementation and Evaluation
   d. Vital Records
   e. Public Health Laboratory (State and Regional Lab Role Only)

2. Communications
   a. Media Communications
   b. Public Communications
   c. Internal and Partner Communications

3. Policy Development and Support
   a. Policy Development
   b. Policy Enactment
   c. Policy Evaluation

4. Partnerships
   d. Partner and Community Relationships

5. Organizational Competencies
   a. Accountability, Performance Management and Quality Improvement
   b. Human Resources
   c. Legal Services and Analysis
   d. Financial Management, Contract and Procurement Services, and Facilities Management
   e. Information Technology/Informatics (IT)
   f. Leadership and Governance

6. Emergency Preparedness and Response
   a. Public Health Preparedness and Response Strategies and Plans
   b. Emergency Support Function 8
   c. Emergency Response
   d. Community Preparedness

7. Health Equity and Social Determinants of Health
   a. Leadership and Workforce Training and Diversity
   b. Health Equity Policy
   c. Health Equity Data
   d. Health Equity Partnerships
   e. Health Equity Communications

B. FOUNDATIONAL SERVICES

1. Communicable Disease Prevention, Investigation and Control
   a. Communicable Disease Prevention
   b. Identify Communicable Disease Prevention, Investigation and Control Assets
   c. Communicable Disease Investigation and Control
   d. Immunization
   e. Coordination of Other Communicable Disease Services with Foundational Capabilities and Services

2. Environmental Public Health
   a. Environmental Health Data
   b. Identify Environmental Health Assets
   c. Environmental Health Investigations, Inspections, Sampling, Lab Analysis and Oversight
   d. Zoonotic Conditions
   e. Land Use Planning and Climate Change
   f. Coordination of Other Environmental Health Services with Foundational Capabilities and Services

3. Maternal, Child, Adolescent, and Family Health
   a. Maternal, Child, Adolescent and Family Health Information
   b. Identify Maternal, Child, Adolescent and Family Health Assets
   c. Collaborative Efforts around Maternal, Child, Adolescent, and Family Health
   d. Maternal, Child, Adolescent and Family Health Improvement
   e. Mandated Newborn Screening (State Role Only)
   f. Coordination of Other Maternal, Child, Adolescent and Family Health Services with Foundational Capabilities and Services

4. Chronic Disease, Injury Prevention, and Behavioral Health Promotion
   a. Chronic Disease, Injury Prevention, and Behavioral Health Promotion Data
   b. Chronic Disease, Injury Prevention and Behavioral Health Promotion Assets
   c. Chronic Disease, Injury Prevention and Behavioral Health Promotion Policies
   d. Coordination of Other Chronic Disease, Injury Prevention, and Behavioral Health Promotion Services with Foundational Capabilities and Services

5. Access to and Linkage with Health Care
   a. Collaborative Efforts Around Access to Clinical Care
   b. Access to Clinical Care Data
   c. Health Facility Inspection and Licensure (State Role Only)
   d. Linkage to Clinical Care
Having incorporated the most relevant components of the FPHS model into an Colorado’s updated CPHS framework, the next step was to develop a comprehensive understanding of the degree to which these services are currently provided, the magnitude and distribution of gaps in core services and the potential additional resources needed to fully implement CPHS statewide.

Toward this end, CALPHO and CDPHE contracted with Habile Consulting LLC to develop and implement a robust CPHS Needs Assessment to:

1. Understand current statewide implementation and spending on core public health services.
2. Estimate the cost to fully deliver core public health services statewide based on the current service delivery paradigm.

The resulting Needs Assessment, was designed to naturally connect to and support the robust public health system transformation planning process already being undertaken in Colorado. This Report represents the results of that Needs Assessment.

**CPHS Needs Assessment Results**

Overall, Colorado’s governmental public health system has achieved a basic level of implementation, with CPHS overall approximately 61% implemented. While
this composite scores is not particularly meaningful in terms of communicating agency- or system-level needs for full implementation (that is, they are at such an altitude that they no longer illustrate where the gaps are for the agency or system) it may be useful to (1) compare the current degree of implementation to full implementation (i.e., how close to full implementation are we?) and (2) as a system-level metric for long term tracking of implementation (i.e., how much progress are we making in implementing CPHS over time?).

To break these composite scores down, we first look at Agency-level current degree of Implementation of CPHS for Colorado systemwide, as shown in Exhibit ES - 3. In Colorado, Governmental public health is decentralized such that the Coloradan’s are served by both a state agency (CDPHE) and local public health authorities (LPHAs), where local governments, primarily counties, retain authority over many decisions related to their budget, public health orders, and the appointment and employment of local health officials.

Variation in implementation by LPHA can lead to service inequities for Coloradans. That is, a Coloradan being served by an LPHA with overall implementation of 4 is likely to have access to substantially different services than one served by an LPHA that has fully implemented CPHS.

Exhibit ES - 3. Agency-level Current Degree of Implementation for CPHS Overall, 2018

To illustrate these implications better at a foundational capability- and service-level in Colorado, Exhibit ES - 4 shows level of implementation at governmental public health agency-level for each foundational capability and service.

While it is true that some functions are more implemented than others, what these composite scores reflect is that there are no CPHS functions that are implemented universally across the entire governmental public health system. Instead, there are varied gaps throughout the entire system, which vary depending on the individual governmental public health agency.

Overall, there are more areas where extra small LPHAs’ work is minimally or limitedly implemented, however this does not mean that those agencies CPHS work is less implemented overall, as these areas likely represent smaller shares of their work. On the whole, there are more extra small LPHAs with lower degrees of overall implementation of CPHS, however, this is more likely a function of the number of extra small LPHAs than directly correlated to LPHA size (based on population served).

Exhibit ES - 4. Current Degree of Implementation of CPHS Foundational Capabilities and Services by Governmental Public Health Agency, including Systemwide Composite Score, 2018

| Degree of Implementation | CDPHE | CHDD | DDPHE | El Paso | Jefferson | Larimer | Boulder | Weld | Pueblo | Mesa | NCDH | San Juan Basin | Broomfield | Garfield | Eagle | Fremont | Montrose | Summit | Delta | Elbert | Montezuma | Routt | Teller | Otero-Crowley | Las Animas-Huerfano | Chaffee | Park | Pitkin |
|-------------------------|-------|------|-------|--------|-----------|---------|---------|------|--------|------|-------|-------------|-----------|---------|-------|---------|---------|--------|-------|--------|--------|---------|------|--------|---------------|------------------|--------|-------|-------|
| 2                       | 75%   | 50%  | 25%   | 0%     | 10%       | 9.0     | 9.2     | 7.4  | 2.0    | 3.5  | 6.0   | 7.6         | 6.5       | 7.2     | 6.5   | 9.0     | 8.8     | 9.6    | 3.9   | 2.4    | 4.5    | 4.7    | 6.4   | 8.9    | 7.1    | 6.3    | 7.8    |
| 4                       | 57%   | 33%  | 10%   | 0%     | 57%       | 5.9     | 7.8     | 7.8  | 7.8    | 7.8  | 7.8   | 7.8         | 7.8       | 7.8     | 7.8   | 7.8     | 7.8     | 7.8    | 7.8   | 8.0    | 8.0    | 8.0    | 7.8    | 8.0    | 8.0    | 8.0    | 8.0    |
| 6                       | 36%   | 18%  | 9%    | 0%     | 36%       | 7.0     | 7.8     | 7.8  | 7.8    | 7.8  | 7.8   | 7.8         | 7.8       | 7.8     | 7.8   | 7.8     | 7.8     | 7.8    | 7.8   | 8.0    | 8.0    | 8.0    | 7.8    | 8.0    | 8.0    | 8.0    | 8.0    |
| 8                       | 23%   | 12%  | 6%    | 0%     | 23%       | 6.7     | 8.9     | 9.6  | 9.6    | 9.6  | 9.6   | 9.6         | 9.6       | 9.6     | 9.6   | 9.6     | 9.6     | 9.6    | 9.6   | 8.0    | 8.0    | 8.0    | 8.0    | 8.0    | 8.0    | 8.0    | 8.0    |
| 10                      | 10%   | 5%   | 3%    | 0%     | 10%       | 9.4     | 9.4     | 9.4  | 9.4    | 9.4  | 9.4   | 9.4         | 9.4       | 9.4     | 9.4   | 9.4     | 9.4     | 9.4    | 9.4   | 8.0    | 8.0    | 8.0    | 8.0    | 8.0    | 8.0    | 8.0    | 8.0    |

Source: Habile, 2019.
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**JANUARY 2020**

**EXECUTIVE SUMMARY**

COLORADO PUBLIC HEALTH SYSTEM TRANSFORMATION

CORE PUBLIC HEALTH SERVICES NEEDS ASSESSMENT REPORT

COLORADO PUBLIC HEALTH SYSTEM TRANSFORMATION

EXECUTIVE SUMMARY

SYSTEMWIDE

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We also used (S)FY 2018 data to generate a statewide estimate for the spending needed to achieve this capacity and expertise in (S) FY 2018. This estimate represents spending on CPHS, and should not be confused with the amount of revenue needed to achieve it. Key findings around the governmental public health system’s current spending on CPHS, include:

Colorado’s governmental public health system spent just over $278 million on CPHS in (S)FY 2018 (approximately $48.90 per capita). This does not include pass through spending from CDPHE to LPHAs - it attempts to count only the dollars spent “on the ground” for CPHS.

A little less than 39% of the governmental public health system’s “on the ground” spending was done by CDPHE, while approximately 61% was done by LPHAs. The distribution of this spending across the CPHS framework varied significantly between CDPHE and LPHAs.

Current spending is approximately 62% of the full cost of implementation. Upstream activities (that is, the types of services like overhead and infrastructure building activities) are more implemented than some of the downstream activities designed to improve population health (the population-based, enabling, and direct health care services). Population-based, enabling, and direct health care services are interdependent on overhead and infrastructure building activities, so the significant gaps in spending on those activities may also impact the ability of governmental public health to implement population-based, enabling, and direct health care services.

Exhibit ES - 5. Current Spending, Full Implementation Cost, and Additional Increment of Cost to Achieve Full Implementation of CPHS by Foundational Capability and Service, FY 2018

<table>
<thead>
<tr>
<th>Foundational Capabilities</th>
<th>Total Estimated Cost of Full Implementation</th>
<th>Current Spending</th>
<th>Additional Increment of Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assessment and Planning</strong></td>
<td>$ 45,324,000</td>
<td>$ 30,837,000</td>
<td>$ 14,487,000</td>
</tr>
<tr>
<td><strong>Communications</strong></td>
<td>$ 14,897,000</td>
<td>$ 7,388,000</td>
<td>$ 7,529,000</td>
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<tr>
<td><strong>Policy Development and Support</strong></td>
<td>$ 13,346,000</td>
<td>$ 7,385,000</td>
<td>$ 5,957,000</td>
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<tr>
<td><strong>Partnerships</strong></td>
<td>$ 11,473,000</td>
<td>$ 8,575,000</td>
<td>$ 2,898,000</td>
</tr>
<tr>
<td><strong>Organizational Competencies</strong></td>
<td>$ 76,456,000</td>
<td>$ 59,323,000</td>
<td>$ 17,133,000</td>
</tr>
<tr>
<td><strong>Emergency Preparedness and Response</strong></td>
<td>$ 16,658,000</td>
<td>$ 9,941,000</td>
<td>$ 6,717,000</td>
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<tr>
<td><strong>Health Equity and Social Determinants of Health</strong></td>
<td>$ 15,088,000</td>
<td>$ 7,492,000</td>
<td>$ 7,596,000</td>
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<tr>
<td><strong>Foundational Services</strong></td>
<td><strong>$ 445,568,000</strong></td>
<td><strong>$ 278,231,000</strong></td>
<td><strong>$ 167,337,000</strong></td>
</tr>
</tbody>
</table>

Source: Habile, 2019.
The full, annual cost of implementing CPHS in Colorado would be $445,568,000 (approximately $78.32 per capita) an additional increment of cost of $167,337,000, in current year dollars. We also estimated a contingency of $21,390,000 on top of that estimate to address potential variability in the results. The full implementation cost estimate (as well as estimates of current spending and the additional increment of spending to achieve full implementation) are point-in-time, planning-level estimates of the regular, annual costs to the governmental public health system on just CPHS, a subset of public health services. When considering these results in the future, adjustments should be made to ensure that they are comparable with current assumptions (like the evolving CPHS framework and service delivery paradigm) and purchasing power.

The “additional increment” represents the additional spending that would need to occur to achieve the incremental increase in capacity and expertise to support full implementation of CPHS statewide. This “additional increment” does not represent the additional revenues needed to fully implement CPHS, as that value is dependent on alignment of funding responsibilities and the security, predictability, and flexibility of existing revenues as discussed later in this Report.

The full implementation cost and additional increment of spending costs do not consider the costs of implementation; that is, the resources that might be required to move from current implementation of CPHS to full implementation. It is expected that these costs will be material. However, they are also likely to be highly dependent on how full implementation of CPHS is phased, and so, should be estimated as part of future phasing and workplan development.

Next Steps

The CPHS Needs Assessment is the first step in an evolving process to implement CPHS through a public health system transformation process. The Needs Assessment clearly articulates the Colorado governmental public health system’s current governance and service delivery paradigm, documents current implementation and spending on CPHS, and estimates the full cost of implementing CPHS at a planning-level. However, it does not clearly articulate how to achieve full implementation of CPHS.

Instead, it is expected that how full implementation will be achieved will be articulated as part of CALPHO and
CDPHE’s roadmap for public health system transformation in Colorado. Achieving full implementation of CPHS will require significant systemic change.

Achieving full implementation of CPHS will require significant systemic change. To support this, it is crucial that Colorado's governmental public health system coalesce around a roadmap for achieving it as part of their broader public health system transformation efforts. This roadmap should guide the many policy choices, both within and outside of the governmental public health system, necessary to achieve public health system transformation. It should also recognize that these decisions will be made both systemically and individually (for individual governmental public health agencies), and support flexibility in individual decision making.

Because public health system transformation is an overarching initiative intended to systemically transform Colorado's governmental public health system, this workplan should be designed to maximize integration within the broader governmental public health system context and existing initiatives, rather than be a standalone initiative.
Background
INTRODUCTION

Our individual health, and the health of our loved ones, is fundamental to our quality of life. In 2015 (the most recent year for which data is currently available), the US spent significantly more on health care (as a percentage of Gross Domestic Product) than other peer, industrialized nations, yet achieved markedly lower health outcomes, including shorter life expectancy.  

This imbalance is so critical, that it is reflected in Governor Polis’ “Bold Four” initiatives and is explicitly identified as the key “wildly important priority” within that initiative: “Save Coloradan’s money on health care.”

Implicit in Governor Polis initiative, is the need to continue to improve health outcomes while reducing health care spending. This is an especially difficult challenge, as US life expectancy, including in the state of Colorado, is facing its longest sustained decline since World War I.

This trend, if left unchecked, means that today’s children are in danger of becoming the first generation in American history to live shorter, less healthy lives than their parents. The Centers for Disease Control and Prevention believes this trend is largely driven by deaths from drug overdose and suicide, of particular concern to Colorado as deaths owed to drug misuse, alcohol, and suicide outpace the US overall.  

A goal to improve health outcomes while also reducing health care spending would seem to be particularly challenging and possibly working at cross purposes. One path to bridging this apparent divide could be increased investment in public health.

There is overwhelming evidence that properly funded public health programs are a cost effective approach to systematically improving the overall health outcomes of communities.

Programs and services that focus on disease and injury prevention, reducing exposure to environmental and health hazards, and the promotion of health are proven to reduce health care costs. In fact, a 2017 study conducted a systemic review of return on investment of public health interventions research and found that investment in public health activities in high-income countries had a median return of 14 to 1.

An effective public health system reduces health care costs by preventing disease and injury, promoting healthy behavior, and reducing the incidents of chronic diseases and conditions. Historically, public health strategies have been successfully employed against complex public health threats like vaccine-preventable communicable disease transmission, lead toxicity, and cigarette smoking. In addressing these threats, public health acted as the chief health strategist, coordinating the complex, multi-sectoral efforts necessary to measurably address the threat.

Public health work is complex and multi-sectoral, bridging policy around health, environment, and social determinants like economic development, education, housing, human services, land use and planning, and transportation, among others. Such work can be hard to define and a “black box”, as the activities are extremely broad while also often being intangible or hard for the residents who benefit from them to see.

When you receive clinical health care services, they are generally a direct, individualized service, and you typically understand the services provided (that is, what you’re paying for); the same is not true for public health services which are often enabling or indirect, population-based services that are delivered

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1 https://ourworldindata.org/the-link-between-life-expectancy-and-health-spending-us-focus  
2 https://dashboard.state.co.us/bold4-health.htm  
3 https://www.tfah.org/state-details/colorado/  
5 NASEM, For the Public’s Health: Investing in a Healthier Future, 2012 (page 29)  
to the population. For these reasons, public health activities are often taken for granted, by both policy makers and the general public, leading to chronic underfunding, unpredictability, and insecurity of funding.

History and Context

In Colorado, many public health activities are delivered by the governmental public health system governed by the State Board of Health (State Board), with services delivered by the Colorado Department of Public Health and Environment (CDPHE) and 53 local public health agencies (LPHAs). Most LPHA's are governed by their own Boards of Health, though in many cases, where LPHAs are single-county agencies serving populations fewer than 100,000 Coloradans, their Board of County Commissioners. Colorado is one of few states that includes environmental health activities as part of its public health work.

2008 Public Health Act

Historically, Colorado’s governmental public health system was bifurcated (as shown in Exhibit 1), with residents living in more urban counties, and comprising approximately 85% of the state population, being served by organized public health departments, while those in more rural areas were served by nursing services.

Thus, local services were delivered through two alternative governance structures, with different authority, administration, and financing, and, often, providing significantly different services. Counties with nursing services often provided services limited to public health nursing activities plus those deemed necessary by their local board of health.

Recognizing that this bifurcation in local public health service provision was leading to service inequities across the state, the Legislature passed the Colorado Public Health Reauthorization Act (SB 08-194) (2008 Public Health Act) in 2008 in large measure to ensure that public health services were available to every person in Colorado, with a consistent standard of quality, regardless of where they lived.

As a starting point, the 2008 Public Health Act prescribed that each county should establish or be part of a LPHA organized under a local board of health with a public health director (and a medical officer, if the director is not a physician) and other staff to provide public health services, which may vary given community needs and population size. LPHAs could choose to employ professionals with specific expertise, share staff with other agencies, or contract with another agency for services.

“The general assembly hereby finds and declares that (a) the public health system reduces health care costs by preventing disease and injury, promoting healthy behavior, and reducing the incidents of chronic diseases and conditions. Thus, the public health system is a critical part of any health care reform. (b) Each community in Colorado should provide high-quality public health services regardless of its location.”

— 2008 Public Health Act Legislative Declaration (C.R.S. 15-1-501)
The restructured local public health system not only ensured that every Coloradan was served by an LPHA, but also increased the physical presence of governmental public health in Colorado by increasing the number of local physical and satellite public health offices in the state, increasing access to local public health services for Coloradans. This legislation also clearly defined the duties of LPHAs (discussed in section Existing Governance and Service Delivery Paradigm).

The legislation also directed the State Board to promulgate by administrative rule, a set of Core Public Health Services (CPHS) as well as minimum standards for those services. Based on this rule, Colorado’s governmental public health system is legally responsible for protecting the public’s health through this set of CPHS. These services are so critical that they are required by state law to be available to everyone, everywhere in Colorado.

The governmental public health system was also tasked with developing a funding formula for distributing funds to LPHAs, with the intention of providing state funding for implementation of CPHS.

The 2008 Public Health Act and administrative rules also include provisions to ensure that these policies do not create an unfunded mandate. “Pursuant to Section 25-1-506(3)(c), C.R.S., when a local board of health does not receive sufficient appropriations to fulfill all of the duties delineated in Section 25-1-506(3)(b), C.R.S., the local board of health shall set priorities for fulfilling the duties and shall include the list of priorities in the local public health plan submitted pursuant to Section 25-1-505, C.R.S.”

It was prophetic that the State Board included language in the CPHS administrative rules to prevent CPHS from becoming an unfunded mandate as, even 10 years later, the governmental public health system does not have the resources to ensure these services are available throughout Colorado, putting all Coloradans at risk. Without these public health services in place, the public health threats they address continue to harm Coloradans’ who would otherwise be protected.
The Act also called upon CDPHE to develop a comprehensive statewide public health improvement plan (PHIP) every five years that assesses and sets priorities for the governmental public health system and:

- Guides the public health system in targeting core public health services and functions through program development, implementation, and evaluation.
- Increases the efficiency and effectiveness of the public health system.
- Identifies areas needing greater resource allocation to provide essential public health services.
- Incorporates, to the extent possible, goals and priorities of public health plans developed by county or district public health agencies.
- Considers available resources, including but not limited to state and local funding, and is subject to modification based on actual, subsequent allocations.

As a starting place, CDPHE led the first statewide plan in 2009. In 2013, the inaugural plan was followed by the first statewide health and environmental assessment, “Colorado Health and Environmental Assessment, 2013.”

The Assessment, and successive assessments, are designed to provide a broad overview of the factors influencing the health and environment of Coloradans and related health outcomes, and inform the subsequent statewide PHIPs, however, they do not assess the governmental public health system’s existing infrastructure or capacity.

While this is intentional, it leaves an acknowledged gap in understanding around the governmental public health system’s ability to address the factors influencing health and environment in Colorado and improve health outcomes on a population health basis.

The subsequent plan, “Shaping a State of Health: Colorado’s Plan for Improving Public Health and the Environment, 2015-2019” included a statewide goal and recommendations designed to continue to improve the governmental public health system’s infrastructure, including through continued implementation of CPHS.

Over the decade since this Act was passed, Colorado has seen many achievements and advancements in public health. However, the Act was passed without being fully funded and, thus, has never been fully implemented. Over a decade later, Colorado’s governmental public health system remains underfunded, and is able to deliver only a share of the services promised by the Act.


While Colorado’s population grew 16% and GDP grew 48% in the last decade, state funding for public health has decreased by 19% (when adjusted for inflation), according to a new analysis provided exclusively to Colorado Association of Local Public Health Officials (CALPHO).

At the same time, between fiscal year (FY) 2000 and 2017, Colorado’s spending on the Department of Health Care Policy and Financing, which includes Medicaid spending, increased from 17.1% to 26.5% of the State’s general fund budget. Given that the State’s general fund budget nearly doubled during that same period, this represents significant growth.

Declining health outcomes, as well as emerging threats like the opioid crisis and potential health impacts from climate change are also demonstrating the increased demand for services.

It’s clear that already insufficient resources for governmental public health activities are not keeping pace with general inflation, let alone population growth or new demands for services.

Without additional funding, implementation of CPHS will decrease – taking Coloradans further from the goal of providing public health services with a consistent standard of quality to every person in Colorado regardless of where they live.

**Funding and Financing Workgroup**

In response to Colorado’s “Shaping a State of Health: Colorado’s Plan for Improving Public Health and the Environment, 2015-2019” CDPHE, in collaboration with CALPHO, formed a Funding and Financing Workgroup to explore opportunities to maximize public health funding in Colorado.

A major outcome was the recommendation to initiate a governmental public health system transformation effort that would allow it to be predictably and sustainably funded, addressing both the organizational capacity and partnerships” and “funding and financing” recommendations from the PHIP.

**Understanding Existing Governmental Public Health Funding and Financing**

A key challenge that the Funding and Financing Workgroup encountered in their work, is that there is not a clear aggregate picture of the existing statewide revenues funding governmental public health. This is partially a result of the decentralized public health system and lack of a uniform chart of accounts among governmental public health agencies, which makes tracking systemwide revenues difficult.

CDPHE and individual LPHAs track their funding by source, and have a clear picture of the revenues available to them, individually, for governmental public health activities.

However, currently, no governmental public health agency or other entity attempts to document the systemwide revenues available to governmental public health in Colorado, although CDPHE has collected some revenue data from LPHAs in some years. Historical records of the systemwide revenues available to governmental public health in Colorado don’t exist either, meaning that our ability to understand longitudinal patterns in systemwide governmental public health funding are extremely limited as well.

Even with CDPHE’s data, if an agency did attempt to collect and consolidate statewide revenue data, the effort would need to address “pass through” revenues. Many sources of funding “pass through” multiple governmental public health providers before they are spent “on the ground.” As a result, it can be difficult to avoid double counting some revenues as they will show up as funding for multiple agencies.

Without a careful accounting of these “pass through” funds, it is likely that a compilation of statewide funding would overstate the revenues available to governmental public health in Colorado.
actual revenues available to be spent “on the ground” for public health purposes.

Also, because all federal pass-through and state appropriations, grants, and contracts are awarded on a reimbursable basis (as discussed following), in some cases, particularly those limited cases where LPHAs account on an accrual basis, revenues may be overstated.

When considering how public health is funded, it is important to understand both the type and source of funding.

**Type of Funding**

For the purposes of understanding the funding challenges facing public health, there are two principal types of funding: (1) categorical funds; and (2) flexible funds.

**Categorical Funds**

Categorical funding is any revenue stream where the funds are limited to a particular use. Most grant funds and fee revenues fall into this category.

**Flexible Funds**

Flexible funds represent revenue streams which can generally be used to cover the full range of eligible public health activities. Some grants can be flexible, but most flexible funds come from general purpose taxes.

**Source of Funding**

Governmental public health in Colorado is funded by a complex web of funders. It’s useful to understand the primary sources of governmental public health funding and the flows of those funding sources, as shown in Exhibit 6 (on the following page).

**Federal Sources**

CDPHE and LPHAs are eligible for and receive federal grants and contracts, which primarily represent categorical funding for specific governmental public health activities (e.g., WIC or Title X family planning services). Some of these grants and contracts are “pass through” grants whereby the State of Colorado, through CDPHE, is the grant recipient and disburses the grant funding to LPHAs and others.

**State Sources**

CDPHE receives state funding from the general fund, Amendment 35, and tobacco litigation settlement and marijuana tax cash funding. Amendment 35 was a tax increase on tobacco products, the revenues from which were designated for health care services and tobacco education. Tobacco litigation settlement funding and marijuana tax cash funding is allocated per Colorado HB16-1408.

LPHAs are eligible for and receive state grants and contracts, which primarily represent categorical funding for specific governmental public health activities (e.g., waste tire facility inspections, marijuana research). LPHAs are eligible for and receive some limited state flexible funding in the form of CDPHE Office of Planning, Partnerships and Improvement (OPPI) Local Planning and Support funds.

These funds are disbursed based on a funding formula, laid out in administrative rule 6 CCR 1014-10 and developed under CDPHE’s funding formula guidelines, which were developed by CDPHE in partnership with a stratified sample of LPHAs representing urban, rural, and frontier interests.

The funding formula ensures that each LPHA receives a base amount of funding (which includes a regional distribution for district LPHAs), while the rest is allocated on a per capita basis. CDPHE is also, from an infrastructure perspective (and not a funding perspective - state funds are only a share of CDPHE funding) broadly supported by the State of Colorado, through which the State provides some supportive services in-kind.

**Local Sources**

LPHAs are often broadly supported by their counties and, in some cases, more narrowly by other county departments and even other governments (cities) and quasi-governmental
BACKGROUND

organizations. From a revenue perspective, these relationships are highly variable, examples include:

- Cash appropriations LPHAs receive directly
- Rent and/or supportive services that CDPHE or LPHAs receive in-kind
- Direct services that other agencies provide that CDPHE or LPHAs do not pay for, including, per statute direct CPHS services delivered by the County Treasurer9, County Attorney10, and County Clerk11

This poses a philosophical challenge in drawing the line in what is appropriately a revenue (cash or in-kind) captured by the governmental public health system, the answer to which should be closely paired with the philosophical challenge in drawing the line in what is appropriately a revenue (cash or in-kind) captured by the governmental public health system.

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9 County treasurers’, as part of their official duties, serve as the treasurer of single county LPHAs’ statutorily mandated county public health funds. In the case of district LPHAs, the County Treasurer of the largest member county of the district service as agency and public health fund treasurer, unless the district LPHA serves a population less than 4,000. In that case the counties may collectively decide which county’s treasurer will preside over the public health fund. (C.R.S. 25-1-511)

10 The county attorney for the county or the district attorney of the judicial district in which a cause of action arises shall bring any civil or criminal action requested by a county or district public health director to abate a condition that exists in violation of, or to restrain or enjoin any action that is in violation of, or to prosecute for the violation of or for the enforcement of, the public health laws and the standards, orders, and rules of the state board or a county or district board of health. (C.R.S. 25-1-514)

11 The county clerk is statutorily obligated to record vital statistics related to marriages (C.R.S. 25-2-106), civil unions (C.R.S. 25-2-106.5), and burials (C.R.S. 25-2-111(7)(a)).

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around which of these are also appropriately a cost incurred by the governmental public health system versus a cost outside of the governmental public health system (the obligation of others).

Counties are obligated to provide $1.50 per capita for public health services in order to be eligible for state public health assistance.

The $1.50 per capita figure was established in 1946 and has not been revised since that time. General price inflation since 1946 has effectively reduced its purchasing power from $1.50 to $0.11 per capita. Alternately, an equivalent level of local funding in 2019 dollars would be $20.75 per capita.

There are no specific requirements about the population metric used to calculate the total commitment based on the $1.50 per capita figure (some counties are using population estimates, as old as 2010 Census population counts).

Also, counties are able to include both cash and in-kind contributions toward meeting the $1.50 per capita requirement. As it stands, some LPHAs might not be receiving a full $1.50 per capita from their county, while the LPHA may still be eligible for state public health assistance.

LPHAs—or in the case of a District LPHA, the largest county’s treasury—are obligated by statute to operate and maintain a public health agency fund through their county treasury, to which any county general funds, federal and state appropriations, and other gifts, grants, donations, or fees for local public health purposes should be credited. However, based on responses to the 2019 Annual Report, several LPHAs are not currently operating in this way.

LPHA data indicates that “spend down” of Public Health Fund balance is a non-trivial revenue source for some LPHAs.

In some cases, cities may be Appropriating funding for public health activities, most often from their own general funds.

**Private Foundations and Other Donations**

CDPHE and LPHAs are eligible for and receive grants and contracts, which primarily represent categorical funding for specific governmental public health activities (e.g., Baby and Me Tobacco Free). In some cases, private funders might donate flexible funds to CDPHE and LPHAs. They may also make specific donations based on CDPHE and LPHAs priorities or specific projects.

**Cost Recovery (Fees and Fines)**

CDPHE and LPHAs are both authorized to charge a variety of fees, including:

- **Non-clinical fees and fines.** These fees and fines are most often related to environmental health inspections and testing, like retail food inspection and water quality testing, but may also be charged as permitting fees (as in the case of onsite sewer permitting). Some of these fees are set by the State in statute, while others are set at the discretion of governmental public health agencies and counties.

- **Clinical fees and fines.** These fees and fines include Medicare/Medicaid, charges to private health insurance and patient personal fees for clinical services like immunizations, family planning, and chronic disease monitoring. In most cases, governmental public health agencies decide what services to charge fees for and the rate of those fees, although some of the fee or reimbursement rates are set by Medicare/Medicaid and private health insurance. In many cases, LPHAs use medical billing services to bill these clinical fees and fines.

Evidence suggests that these fees and fines do not fully recover the cost of delivering the services for which the fees are collected. However, this is not necessarily a bad thing, depending on the governmental public health system’s perspectives around the degree to which the costs of any one service should be recovered.

Further, cash funds like fees contribute towards TABOR revenue limits. For those governmental public health
agencies subject to TABOR revenue limits, collection of categorical fees and fines may lead to necessary refunding of general funds (flexible funding). This may create a disincentive for full cost-recovery of some services through fees and fines.

Other Miscellaneous

CDPHE and individual LPHAs may have other miscellaneous revenue sources, like interest income or revenue from the sale of surplus assets. These sources are often quite small, generating very small amounts of revenue.

Challenges

A complicating factor in understanding the availability of revenues for governmental public health in Colorado, is that all federal pass-through and state appropriations, grants, and contracts are awarded on a reimbursable basis. What that means, is that agencies don’t receive the funding until after they have made the expenditure.

Despite the statutory obligation to maintain a public health fund, not all agencies have the cash flow flexibility to quickly or efficiently fund ongoing operations while waiting for reimbursement.

This in one of the issues that has historically led to a significant reversion of revenues throughout the system. In SFY 2018, $139,294,352.11 of federal and state revenues were known to have reverted. This is likely an underestimate, as it doesn’t include any reversions of funds received directly by LPHAs.

Another significant challenge of the current funding model is the degree to which public health programs are funded through categorical sources (primarily grants, fees) that can only be spent for specific activities. As a result, agencies need to carefully blend and braid funding sources to account for these restrictions and support all of their programs and services.

Reliance on categorical funding also has a significant influence on the services available to communities in Colorado as services that are eligible for categorical funds are prioritized over other community needs that do not have access to targeted funding.

Many categorical funding streams are grants and contracts from the federal government, state government, and private funders. In many cases, governmental public health agencies must compete for these funds by submitting applications that describes how the funds will be used and the value of the funded program(s).

Agencies also need to adhere to the specific provisions related to each grant and contract. These provisions may include matching fund requirements (which may siphon from from already limited flexible funding streams) and have unique reporting and monitoring requirements, which can be arduous for agencies to complete.

As a result, agencies need adequate staffing and infrastructure to compete for and administer grant funding. The indirect rates that are allowed on many grants are generally insufficient to cover the full indirect costs of these program revenues.

As part of the 2019 Annual Report to CDPHE OPPI, LPHAs provided insight into their perceptions of the security and predictability of governmental public health revenues sources.

Overwhelmingly, LPHAs expressed that the majority of their funding, or at least a majority of their funding sources are either insecure and/or unpredictable. Key themes expressed by LPHAs included:

- **All governmental funding sources are insecure.**
  - Federal funding sources (like WIC and Title X) are always being threatened at the federal level at the whims of the current administration.
  - State appropriations are limited by TABOR.
  - Amendment 35 funds continue to decrease, as tobacco sales decrease.
  - County taxes are particularly susceptible to fluctuations in the economy, and, for many LPHAs, county support ebbs and flows with the
Grants and contracts constantly come and go. Success in winning a grant or contract once, doesn’t ensure future success. More and more LPHAs are competing for grants and contracts against nonprofits and others who employ or contract professional grant writers, giving them an advantage. Also, the cyclical nature of many grant programs is difficult to manage with a steady professional workforce. This is particularly true of private funding, as foundation funding priorities change year to year.

Non-clinical fees and fines ebb and flow with the economy.

Clinical fees and fines (Medicaid/Medicare, Private health insurance, and patient personal fees) vary year to year based on clients served. Many LPHAs are seeing their clients decline as their focus shifts from clinical care to population-based services and as more Coloradans have health insurance due to the Affordable Care Act. The remaining clients are often least likely to be enrolled in Medicaid/Medicare, have private health insurance, or be able to pay patient personal fees, leaving LPHAs susceptible to accruing bad debt. LPHAs still play an important assurance role in providing clinical care services to these individuals. However, this effectively increases the unit cost of delivering that assurance service, while reducing overall cost recovery.

While our initial understanding of existing governmental public health funding and financing challenges are that revenues are insufficient, the full picture is much more complex.

Not only are current revenues insufficient, but they are too inflexible, insecure, and unpredictable to sustainably fund Colorado’s governmental public health system. Existing categorical revenues overly constrain the system, while the costs of competing for and maintaining these sources outpace the overhead allowable through the grant.

Further, while we don’t have longitudinal data to show that existing revenues have not kept pace with demand for governmental public health services (or even inflation or population growth), we do have several examples (like the static county $1.50 per capita contribution rate first set in 1946 and the decline in Amendment 35 revenues) that demonstrate how they have not.

Public Health System Transformation

Despite the unequivocal success of the 2008 Public Health Act in restructuring Colorado’s governmental public health system, there is still work to be done to ensure that the system is fully funded and CPHS are available to every person in Colorado with a consistent standard of quality, regardless of where they live, as the Act envisioned.

Current funding is not only inadequate, but also too restricted, unpredictable, and insecure to accomplish this goal. Fully implementing CPHS will require more predictable, reliable, and sustainable funding that allows for flexibility and responsiveness to changes in public health risks and service demands, not to mention cost, over time.

This funding challenge is not unique to Colorado. Nationally, previous governmental public health fiscal sustainability efforts have had limited success, in large part because they have often been too narrowly focused on increasing funding, but also because it has, historically, been difficult to articulate what public health funding would buy and the long term effect of those dollars.

In 2009, the Institute of Medicine (IOM) now the National Academy of Medicine under the umbrella of the National Academies of Sciences Engineering, and Medicine (NASEM) formed a committee to consider three topics related to population health: data and measurement, law and policy, and funding.

The committee’s work culminated in three reports, one for each of the three topics considered. In the third and final report, “For the Public’s Health: Investing in a Healthier Future (2012)”, NASEM:

- “Review[ed] current public health funding structures
- Assess[ed] opportunities for use of funds to improve health outcomes
- Review[ed] the impact of fluctuations in
funding for public health

- Assess[ed] innovative policies and mechanisms for funding public health services”

For the Public’s Health also found there was a mismatch between health spending and desired health outcomes. The report further acknowledges that “the allocation of public health spending also is not commensurate with need or with achieving the greatest value: conditions responsible for the highest preventable burden of disease are considerably underfunded.” It also suggests that funding for public health services should be part of the solution, suggesting that public health can “bend the curve” on health risks, to decrease the need for clinical health care while improving health outcomes.

It’s notable, that the final report references the “Dysfunction of the Current Public Health Funding System,” which makes the same observations around the challenges of funding governmental public health at the national level that we observe here in Colorado.

Recognizing both the funding challenges faced by public health and the lack of clear articulation of public health activities on which to define the funding need, NASEM’s final report included a recommendation that “public health agencies at all levels professional associations, policy makers and other stakeholders should endorse the need for a minimum package of public health services.”

In April 2013, the Public Health Leadership Forum, funded by the Robert Wood Johnson Foundation and facilitated by RESOLVE, took up this challenge and developed a national model for a “minimum package of services”.

The Foundational Public Health Services (FPHS) framework introduced a package of foundational capabilities and programs that the group felt were needed everywhere for public health to work anywhere.

Exhibit 7. For the Public’s Health: Investing in a Healthier Future, NASEM, 2012

Exhibit 8. National FPHS Framework


14 NASEM, For the Public’s Health: Investing in a Healthier Future, 2012 (page 4) 15 NASEM, For the Public’s Health: Investing in a Healthier Future, 2012 (page 6)
These capabilities and services represent a subset of all public health services and focus on activities that: (1) must be available to all people served by the governmental public health system; and, (2) meet one or more of the following criteria:

- Services that are mandated by federal or state laws.
- Services for which the governmental public health system is the only or primary provider of the service statewide.
- Population-based services (versus individual services) that are focused on disease prevention and protection and promotion of health.

This national framework, now stewarded by the Public Health National Center for Innovations (PHNCI), has been and continues to be adopted and localized by states across the nation, including Colorado. More information on the national FPHS framework is available here.

However, mere localization and adoption of the FPHS framework alone has not solved states’ governmental public health funding challenges. In states where local FPHS frameworks have been adopted, such as Ohio, Oregon, and Washington, FPHS is part of a broader public health system transformation effort seeking to improve both the financial sustainability and the effectiveness of public health as a critical element supporting statewide health outcomes.

The FPHS model attempts to incorporate a comprehensive approach to improving public health by:

- “Right-sizing” governmental public health’s role and scope of services;
- Optimizing the efficiency and effectiveness in delivery of services;
- Defining level of service standards;
- Supporting funding flexibility to amplify and enhance investments in locally driven priority public health activities that address specific community concerns and priorities;
- Increasing funding and aligning funding responsibility to accountability for services throughout the system; and,
- Supporting longitudinal tracking and performance management against metrics that are agreed upon and meaningful.

While this is an emerging model for public health system transformation, Colorado has had the benefit of learning from the experiences in Ohio, Oregon, and Washington (collectively the 21st Century Learning Community) who have been engaged in this work for over five years. These efforts have provided significant resources and lessons learned, giving Colorado the opportunity to build on this knowledge base while being a national leader in the effort to successfully implement FPHS (CPHS).

To this end, Colorado is participating in a national learning community, the FPHS Learning Community, convened by PHNCI, for states involved in statewide efforts to adopt the FPHS framework.

The FPHS Learning Community is intended to allow members to share their experiences and lessons learned from their individual FPHS implementation efforts. The other states engaged, include: California, Kansas, Kentucky, Minnesota, Missouri, Ohio, Oregon, and Washington. The Learning Community began in January 2019 and will continue through December 2021.

**Colorado’s Public Health System Transformation Initiative**

Together, CALPHO and CDPHE are developing a roadmap for public health system transformation in Colorado and have identified the FPHS framework and related public health system transformation efforts as the best model for Colorado’s effort.

The first step in this process was to align Colorado’s CPHS with the FPHS framework. Colorado’s CPHS framework, as codified by the 2008 Public Health Act, already included over 75% of the national FPHS framework components.

After going through this process, it was determined that the best approach was to maintain the terminology in Colorado’s Public Health Act while expanding the concept of the Core Public Health Services to align to the
FPHS framework. Having incorporated the most relevant components of the FPHS model into an updated CPHS, the next step was to develop a comprehensive understanding of the degree to which these services are currently provided, the magnitude and distribution of gaps in core services and the potential additional resources needed to fully implement CPHS statewide.

Toward this end, CALPHO and CDPHE have contracted with Habile Consulting LLC to develop and implement a robust CPHS Needs Assessment to:

1. Understand current statewide implementation and spending on core public health services.
2. Estimate the cost to fully deliver core public health services statewide based on the current service delivery paradigm.

Additionally, the process was designed to naturally connect to and support the robust public health system transformation planning process already being undertaken in Colorado, which meant that the needs identified should be defined in the context of the existing governmental public health system, made up of CDPHE and 53 LPHAs, and based on the existing service paradigm. Further, the Needs Assessment also should consider related policy around topics like governance, service delivery, and funding.

To do that, the CPHS Needs Assessment data collection process was designed to:
- Engage CDPHE and all 53 LPHAs in the data collection process to collect as much primary data as possible.
- Build a shared understanding of the refined CPHS framework and definitions.
- Collect data through targeted questions around the project purpose (i.e., current implementation and spending on the and the full cost of implementation of CPHS) and related policy (e.g., governance, service delivery, funding, etc.).
- Validate collected data and, if necessary, fill information gaps.
- Connect to Colorado’s broader public health system transformation efforts and leverage the data collection process to assist with other ongoing project components.

The balance of this report is organized into the following major sections:
- Methods
  - CPHS Needs Assessment Development
- Results
  - Existing Governance and Service Delivery Paradigm
  - Current Implementation and Spending on CPHS
  - Needs for Achieving Full Implementation of CPHS
- Discussion
  - Implementation Considerations
  - Conclusions and Outstanding Questions
  - Next Steps
Methods
Core Public Health Services Needs Assessment Development

Assumptions

This CPHS Needs Assessment has two principal objectives:

1. Build a comprehensive statewide picture of the current implementation and spending on core public health services.

2. Estimate the cost to fully deliver core public health services statewide based on the current service delivery paradigm.

The information gathered in the process of achieving these objectives will also provide a clear understanding of the type, magnitude, of “gaps” between the current and desired “full implementation” condition and the needs to achieve that condition.

Additionally, this process was designed to support the robust public health system transformation planning process already being undertaken in Colorado. Toward this end, the needs identified should be defined in the context of: (1) the existing governmental public health system, which comprises CDPHE and 53 LPHAs; and, (2) based on the existing governance and service delivery paradigm.

Further, the Needs Assessment should seek to add to the understanding of how issues like governance, service delivery, and funding may influence implementation of CPHS.

Governmental Public Health

The public health system is made up of public, private, and non-profit entities that contribute to the delivery of public health services. These entities represent a network of services with differing roles, relationships, and interactions that contribute to the health and well-being of communities throughout Colorado.

Governmental public health is a subset of this overall system, and is generally responsible for those services most consistent with the role of government and, in some cases, where governmental public health steps in to fill a critical need in a community that is not being provided by the private or non-profit sector.

This Needs Assessment is designed to narrowly focus on activities that have been determined to be the appropriate responsibility of governmental public health.

In Colorado, Governmental public health is decentralized such that the Coloradan’s are served, at the state level, by CDPHE (governed by the State Board commissions) and, at the local level, by LPHAs where local governments, primarily counties, retain authority over many decisions related to their budget, public health orders, and the appointment and employment of local health officials.

CDPHE does benefit from services provided by other state departments, in some cases, such as information technology support provided by Colorado’s Office of Information Technology, the cost of this support is borne by CDPHE.

At the local level, most LPHAs are similarly organized as County department and benefit from services provided by other county departments. In a few instances, the LPHA is supported by a separate local government (typically a City) or a quasi-governmental organization.
The type of support and how the financial responsibility for these support functions is assigned are highly variable at both the state and local level. Examples include:

- Rent and/or management support services provided for a fee
- Rent and/or management support services provided in-kind (no financial exchange)
- Direct services provided by another agency for a fee
- Direct services provided by another agency without direct compensation, including, per statute direct CPHS services delivered by the County Treasurer\(^\text{18}\), County Attorney\(^\text{19}\), and County Clerk\(^\text{20}\).
- Direct public health services and/or funding provided to partners in the non-governmental sector.

The diversity of these relationships creates a practical challenge to consistently and appropriately accounting for costs associated with related entities beyond CDPHE and the 53 LPHAs.

To address this issue it was determined the Needs Assessment would focus on capturing only those costs that might reasonably in the future be incurred by the LPHA, either directly or indirectly. For example, we included:

- Rent and/or management support services provided for a fee
- Rent and/or management support services provided in-kind, that a “typical” agency would otherwise pay for, such as rent, facilities management cost, information technology services, etc.
- Direct services provided by other agencies for a fee

Examples of costs which were excluded from the analysis:

- Rent and/or management support services provided in-kind, that a “typical” agency would not otherwise pay for, such as County or State governance and leadership
- Direct services provided by another agency without director compensation, including, per statute direct CPHS services delivered by the County Treasurer, County Attorney and County Clerk.
- Direct services delivered by other agencies outside of the governmental public health system\(^\text{21}\)

In some cases, this may be a limitation of the analysis, as discussed in section Core Public Health Services Needs Assessment Development, Limitations.

### Programmatic Framework

As discussed previously, Colorado’s CPHS framework, as codified by the 2008 Public Health Act, already included over 75% of the national FPHS model components within it’s existing service categories:

- Administration and Governance
- Assessment, Planning, and Communication
- Communicable Disease Prevention, Investigation, and Control
- Emergency Preparedness and Response
- Environmental Health
- Prevention and Population Health Promotion
- Vital Records and Statistics

At Public Health in the Rockies in 2018, the Colorado governmental public health system, led by CALPHO, voted to align Colorado’s existing CPHS framework to FPHS, with the following customizations:

- The existing core service Vital Records and Statistics would become a function within the foundational capability Assessment

\(^{18}\) County treasurers’, as part of their official duties, serve as the treasurer of single county LPHAs’ statutorily mandated county public health funds. In the case of district LPHAs, the County Treasurer of the largest member county of the district service as agency and public health fund treasurer, unless the district LPHA serves a population less than 4,000. In that case the counties may collectively decide which county’s treasurer will preside over the public health fund. (C.R.S. 25-1-511)

\(^{19}\) The county attorney for the county or the district attorney of the judicial district in which a cause of action arises shall bring any civil or criminal action requested by a county or district public health director to abate a condition that exists in violation of, or to restrain or enjoin any action that is in violation of, or to prosecute the violation of or for the enforcement of, the public health laws and the standards, orders, and rules of the state board or a county or district board of health. (C.R.S. 25-1-514)

\(^{20}\) The county clerk is statutorily obligated to record vital statistics related to marriages (C.R.S. 25-2-106), civil unions (C.R.S. 25-2-106.5), and burials (C.R.S. 25-2-111)\(^{(7)}\)(a).

\(^{21}\) With the exception of direct services from Denver Public Health (DPH) to the Denver Department of Public Health & Environment (DDPHE), which is a special circumstance, discussed in Appendix D: Assessment Data Collection and Validation Process and Methodology (page A-34).
Exhibit 9. Colorado CPHS Framework

A. FOUNDATIONAL CAPABILITIES

1. Assessment and Planning
2. Communications
3. Policy Development and Support
4. Partnerships
5. Organizational Competencies
6. Emergency Preparedness and Response
7. Health Equity and Social Determinants of Health

B. FOUNDATIONAL SERVICES

1. Communicable Disease Prevention, Investigation and Control
2. Environmental Public Health
3. Maternal, Child, Adolescent and Family Health
4. Chronic Disease, Injury Prevention and Behavioral Health Promotion
5. Access to and Linkage with Health Care

Source: Habile, 2019.
The existing core service Prevention and Population Health Promotion would be split into two foundational services: Chronic Disease, Injury Prevention, and Behavioral Health Promotion and Maternal, Child, Adolescent, and Family Health.

Health Equity and Social Determinants of Health would be a foundational capability, rather than a function within the foundational capability Organizational Competencies.

The resulting changes did not exclude any of Colorado’s existing CPHS. Rather, the process added to and built upon the CPHS with additional detail to better communicate the limits of core services and activities.

The updated CPHS were then promulgated through an administrative rule change; the Colorado State Board of Health adopted Colorado’s updated CPHS framework April 17, 2019 into the Code of Colorado Regulations (6 CCR 1014-7 Core Public Health Services), the official publication of Colorado’s state administrative rules.

This framework goes into effect January 1, 2020. These definitions are intended to be accompanied by regulations setting minimum quality standards, however, those minimum quality standards have not yet been updated for consistency with the updated CPHS definitions.

Together, the foundational capabilities and foundational services are the limited statewide set of core public health services that must exist everywhere for services to work anywhere.

However, for the governmental public health system to successfully and consistently implement CPHS, the definitions needed to be operationalized to:

- Describe “what” CPHS provides for Colorado’s communities, but not “how” the governmental public health system should provide it,
- Be agnostic to which governmental public health provider should provide it,
- Identify discreet activities, by defining as few actions as possible per statement, and begin each with a verb identifying the action to be taken and,
- Align with existing statutes, rules, regulations and guidelines.

In 2019, the Colorado Public Health System Transformation Steering Committee oversaw the development of these operational definitions through significant engagement and policy development process summarized in the OPERATIONAL DEFINITIONS DEVELOPMENT PROCESS sidebar.

The final operational definitions add detail to the CPHS framework by adding functions to all foundational capabilities and services (beyond those already codified in administrative rule for Organizational Competencies).
Further, definitions were organized in a nested structure (as described on the following page), that calls out the functions, elements, and activities that the governmental public health system must deliver for residents for CPHS to be fully implemented.

These operational definitions, were published in a “final draft” operational definitions manual (the Colorado Public Health System Transformation Core Public Health Services Operational Definitions Manual, Final Draft May 2019) and in that “final draft” form, were used as the programmatic framework of this Assessment. That is, all the Assessment data and results were collected specific to those definitions.

The assessment intentionally used “final draft” operational definitions as the programmatic framework, so the process could provide an additional opportunity to refine those definitions.

While most of the CPHS definitions were reinforced by the Assessment process, respondents suggested having two functions related to laboratory services (a general function within the Assessment and Planning Capability and a separate function within Communicable Disease Prevention, Investigation, and Control) was duplicative and that all of the laboratory activities be consolidated in Assessment and Planning.

We also observed that the definitions related to the foundational capability Health Equity and Social Determinants of Health and the foundational service Access to and Linkage with Health Care are at slightly different altitudes than the other foundational capabilities and programs; they both have several elements and very few, if any activities. This isn’t necessarily an issue, but it does imply that those definitions could be fleshed out more, in the future, to better define what it means to operationalize them.

While we used the Foundational Public Health Services Functional Definitions Manual, dated May 2019 as the programmatic framework for the Assessment, these changes have been made in a final version to be published in November 2019.

The analysis and any references to specific CPHS operational definitions have been numbered per that final version to allow for easy wayfinding between the Assessment results and the CPHS operational definitions.

It is expected that the CPHS framework and operational definitions will continue to evolve, with the public health practice.

Use of these operational definitions did present some challenges. First, the (final) framework, is extremely detailed, including 7 foundational capabilities and 5 foundational services; 52 functions; 114 elements, and 343 activities. Given the depth of the definitions, it was important to frame limit the number and type of questions based on a reasonable expectations about the amount of time respondents will have to respond.

Second, the operational definitions are extremely complex, as they nest, such that the activities are assigned to the elements on a one-to-one basis, the elements are assigned to the functions on a one-to-one basis; and the functions are assigned to the foundational capabilities and services on a one-to-one basis.

While intuitively, it may seem like the activities should “add up” to the elements, one of the challenges is that “the whole [element] may be greater than the sum of its parts [activities].” This is a greater concern at the extremely detailed element and activity level, because the specificity those definitions makes it possible that some minor, but relevant activities, may fall through the cracks.
CPHS DEFINITIONAL COMPONENTS

A. Foundational Capability or Foundational Service.
CPHS in Colorado include both foundational capabilities and foundational services. Foundational capabilities are denoted by “A.” and are the crosscutting capacity and expertise needed to support public health programs. Foundational services are denoted by “B.” and are the subset of services in each public health program area that are defined as foundational.

1. Actual Foundational Capability or Service.
Colorado’s CPHS framework includes seven foundational capabilities and five foundational services denoted by numerals and individually assigned as either a foundational capability or service, such that they are represented as “[Foundational Capability (A) or Foundational Service (B)].[Foundational Capability or Service number].”.

a. Function.
Colorado’s foundational capabilities and services are further reduced to 53 “functions” which organize the different elements and activities of CPHS to describe the work being done. Functions are denoted by lowercase letters and individually assigned to one foundational capability or service, such that they are represented as “[Foundational Capability (A) or Foundational Service (B)].[Function lowercase letter].”.

i. Definitions.
Colorado’s CPHS functions are described in detail by 114 “definitions” that represent the various work elements of each function. Definitions are denoted by uppercase Roman numerals and individually assigned to one function, such that they are represented as “[[Foundational Capability (A) or Foundational Service (B)].[Function lowercase letter].[Definition uppercase Roman numeral].”.

ii. Operational Definition.
In some cases, “definitions” are not reduced down to discrete “activities;” that is they may define more than one action per statement. Where that is the case, they are further described by 346 “operational definitions” which describe the various work activities under each definition. Operational definitions are denoted by lowercase Roman numerals and individually assigned to one function, such that they are represented as “[[Foundational Capability (A) or Foundational Service (B)].[Function lowercase letter].[Definition uppercase Roman numeral].[Operational Definition lowercase Roman numeral].”.

The nested structure of Core Services allows functions (denoted by lower case letters) to be further defined by definitions (denoted by uppercase Roman numerals); and the definitions, in turn, can be further explained by the addition of operational definitions (denoted by lowercase Roman numerals).

Example: A.1. denotes the foundational capability “Assessment and Planning.”

Example: A.1.a. denotes the first Assessment and Planning function “Data Collection and Distribution.”

Example: A.1.a.i. denotes the first operational definition, “i. Ensure capacity to collect primary qualitative data” under the first definition, “i. Colorado’s governmental public health system will be a trusted source of clear, consistent, accurate, and timely health and environmental information. The system will consistently use equitable, multi-directional communication strategies, interventions, and tools to support all public health goals” under the first Assessment and Planning function “Data Collection and Distribution.”
Exhibit 10. Colorado CPHS Foundational Capabilities and Services and Functions and Code Key

A. FOUNDATIONAL CAPABILITIES

1. Assessment and Planning
   a. Data Collection and Distribution
   b. Data Access, Analysis and Interpretation
   c. Health Assessment Development, Implementation and Evaluation
   d. Vital Records
   e. Public Health Laboratory (State and Regional Lab Role Only)

2. Communications
   a. Media Communications
   b. Public Communications
   c. Internal and Partner Communications

3. Policy Development and Support
   a. Policy Development
   b. Policy Enactment
   c. Policy Evaluation

4. Partnerships
   d. Partner and Community Relationships

5. Organizational Competencies
   a. Accountability, Performance Management and Quality Improvement
   b. Human Resources
   c. Legal Services and Analysis
   d. Financial Management, Contract and Procurement Services, and Facilities Management
   e. Information Technology/Informatics (IT)
   f. Leadership and Governance

Source: Habile, 2019.
### 6. Emergency Preparedness and Response
- b. Emergency Support Function 8
- c. Emergency Response
- d. Community Preparedness

### 7. Health Equity and Social Determinants of Health
- a. Leadership and Workforce Training and Diversity
- b. Health Equity Policy
- c. Health Equity Data
- d. Health Equity Partnerships
- e. Health Equity Communications

### B. FOUNDATIONAL SERVICES

#### 1. Communicable Disease Prevention, Investigation and Control
- a. Communicable Disease Prevention
- b. Identify Communicable Disease Prevention, Investigation and Control Assets
- c. Communicable Disease Investigation and Control
- d. Immunization
- e. Coordination of Other Communicable Disease Services with Foundational Capabilities and Services

#### 2. Environmental Public Health
- a. Environmental Health Data
- b. Identify Environmental Health Assets
- c. Environmental Health Investigations, Inspections, Sampling, Lab Analysis and Oversight
- d. Zoonotic Conditions
- e. Land Use Planning and Climate Change
- f. Coordination of Other Environmental Health Services with Foundational Capabilities and Services

#### 3. Maternal, Child, Adolescent, and Family Health
- a. Maternal, Child, Adolescent and Family Health Information
- b. Identify Maternal, Child, Adolescent and Family Health Assets
- c. Collaborative Efforts around Maternal, Child, Adolescent, and Family Health
- d. Maternal, Child, Adolescent and Family Health Improvement
- e. Mandated Newborn Screening (State Role Only)
- f. Coordination of Other Maternal, Child, Adolescent and Family Health Services with Foundational Capabilities and Services

#### 4. Chronic Disease, Injury Prevention, and Behavioral Health Promotion
- a. Chronic Disease, Injury Prevention, and Behavioral Health Promotion Data
- b. Chronic Disease, Injury Prevention and Behavioral Health Promotion Assets
- c. Chronic Disease, Injury Prevention and Behavioral Health Promotion Policies
- d. Coordination of Other Chronic Disease, Injury Prevention, and Behavioral Health Promotion Services with Foundational Capabilities and Services

#### 5. Access to and Linkage with Health Care
- a. Collaborative Efforts Around Access to Clinical Care
- b. Access to Clinical Care Data
- c. Health Facility Inspection and Licensure (State Role Only)
- d. Linkage to Clinical Care

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**OVERALL REPORT**

**JANUARY 2020**
State and Regional Roles

Although the CPHS framework and Operational Definitions are designed to be agnostic as to which governmental public health agency provides them, there are three functions within the CPHS framework that are specific to particular governmental public health agency providers.

- **A.1.e Public Health Laboratory.** Denoted in the CPHS Operational Definitions manual as a “State and Regional Lab Role” only. There is one state lab (operated by CDPHE) and three regional labs (operated by El Paso County Public Health, Pueblo Department of Public Health and Environment, and Weld County Department of Public Health and Environment.

- **B.3.e Mandated Newborn Screening.** Denoted in the CPHS Operational Definitions manual as a “State Role Only,” this function is currently only being implemented (that is, it is being provided statewide) by CDPHE. This is because, per statute, health facility inspection and licensure is part of CDPHE’s powers and duties.

Types of Services

The CPHS framework includes a range of services, including:

- **Direct Health Care Services.** Health care services that are directly provided to individuals.

- **Enabling Services.** Services that help families access and use direct health care services, and are usually targeted to families that have special needs or face barriers to accessing services.

- **Population-based Services.** Health and environmental risk prevention, health promotion, and health and environmental protection activities delivered indirectly to a community or population.

- **Infrastructure-Building Services.** Services that lay the foundation for policies and programs that improve health and wellbeing.

- **Overhead Services.** Services that allow for governmental public health agency operation, but have no other community benefit (e.g., financial management).

This categorization has been adapted from the Maternal and Child Health pyramid developed as part of Federal Title V work\(^2\). Our modified version, shown in Exhibit 11 following is a useful schema for understanding what governmental public health does and for whom.

While it would be most appropriate to categorize each element and activity using this schema, for our purposes, to support high-level analysis found later in this report, it is acceptable to merely categorize the CPHS functions, as shown in Exhibit 12, on the following page.

Relationships Among Services

The CPHS framework and operational definitions make no attempt to understand the relationships among CPHS activities. This is a challenge because we know that the relationships among the CPHS activities create some interdependencies; that is, you can’t accomplish one CPHS activity without first accomplishing another.

For example, CHAPS planning occurs on an eight phase planning cycle, whereby governmental public health agencies must conduct a community health assessment and capacity assessment (element A.1.c.I) before engaging in the prioritization process and development and community health improvement plan (element A.2.c.II).

\(^2\) [http://www.amchp.org/AboutTitleV/Documents/MCH_Pyramid_Purple.pdf](http://www.amchp.org/AboutTitleV/Documents/MCH_Pyramid_Purple.pdf)
Types of services give us a broad framework for general interdependencies; that is we know that, generally, overhead services, support infrastructure-building services, which in turn support population-based services, which support enabling services and, ultimately, direct health care services.

However, it could be useful to complete a network analysis to better understand these relationships and potential interdependencies among CPHS operational definitions before pursuing full implementation of CPHS, to prevent them from becoming barriers to implementation as full implementation is phased in.

Exhibit 11. Colorado CPHS Foundational Capabilities and Services and Functions by Type of Service

Exhibit 12. Colorado CPHS Types of Services
State and Local Priority Services

As discussed previously, the CPHS are a subset of all public health services that may be delivered by governmental public health agencies. These generally exclude individualized interventions that are not state- or federally-mandated; services that are not the role of governmental public health or for which there are other appropriate providers beyond governmental public health; and/or any services that are not needed everywhere to work anywhere.

This is not a value judgment – there are certainly non-Core Public Health Services (non-Core) that are as important as Core Public Health Services, but which are not needed everywhere to work anywhere. These non-Core services are critical local or state priorities; they are no less important than CPHS. However, the variation in their delivery (based on priorities and service delivery where they may be delivered by entities beyond the governmental public health system) means that they are difficult to define and quantify.

There may also be an unaccounted share of foundational capabilities that represent the additional, variable increment of capabilities needed to fully implement these “state and local priority services”; we refer to this as the “additional increment of foundational capabilities attributable to state and local priority services”.

While, per the framework, the additional increment of cost related to this additional share of foundational capabilities should be included in the full cost of CPHS, they cannot be quantified without first defining state and local priority services.

As of this report, no significant effort has been made to define or quantify the full cost of state and local priority services for Colorado. As such, we make no attempt to generate the full cost of delivering all (both CPHS and state and local priority services) needed public health services in Colorado, focusing instead on only the full cost of implementing CPHS per our project purpose and scope.

Time Period

The Needs Assessment was intended to generate a point-in-time estimate of current spending on CPHS for the most recently available one-year period, and the full, annual cost of delivering CPHS in today’s (2019) dollars.

The 54 governmental public health agencies who provided data as part of this Assessment operate on two different fiscal schedules, with the state public health agency operating on a state fiscal year schedule (July 1 to June 30) and the 53 local public health agencies operating on a calendar year schedule (January 1 to December 31). More information on how this was reconciled is provided in Appendix D: Detailed Needs Assessment Data Collection and Validation Process and Methodology.

Primary Data

A component of the overall CPHS Needs Assessment project was the Needs Assessment data collection and validation process described in Appendix D: Detailed Needs Assessment Data Collection and Validation Process and Methodology.

This part of the overall process generated a primary dataset on the current implementation and spending on, and estimated full cost of implementing, CPHS in Colorado.

Primary data was collected from all 54 governmental public health agencies in Colorado, as well as close system partners Denver Public Health and Northwest Colorado Health.

To do this, an Excel-based Assessment Tool was developed to allow for consistent data collection from all respondents. The Assessment Tool included 13 data collection tabs, one for each each foundational capability or service and one to act as LPHAs’
2019 Annual Report to CDPHE OPPI.

Each governmental public health agency provided, at a minimum, the following in their Assessment response:

- Complete 2019 Annual Report tab and sign-off
- Identification of current sharing relationships for all functions
- Self-assessment of capacity and expertise for all elements and activities
- Complete current spending allocation for all functions (recognizing that current spending might be 0 FTE and $0 for some LPHAs in some areas)
- Complete full implementation estimates for all functions
- Dashboard sign-off

Many governmental public health agencies also responded to the other “as-needed” prompts in the Assessment Tool. In these areas, there was a response rate (n) of less than 54, however, it was assumed that additional data would only serve to reinforce what was learned from more active respondents. Where these results are quantified, the number of respondents is noted.

This additional information represents thousands of additional data points that help to clarify and improve understanding of the current situation or future needs.

Secondary Data

The results and findings presented in this report are primarily based on analysis generated using the primary data discussed previously, however, as necessary for validation and to augment our understanding of the existing system we did access a few other data sources:

- Colorado State Demographer’s Office 2018 population and population living in poverty estimates
- CDPHE Open Data ArcGIS portal
- SFY 2018 and FY 2018 CDPHE CORE accounting grants and contract ledger
- SFY 2018 CDPHE financial reporting

In addition, the data and analysis in this report was synthesized based on our understanding of its context; that is, we considered the existing policy and statutory framework through which the results herein are achieved or anticipated.

As such, we would consider C.R.S. Title 25: Public Health and Environment as a secondary source in this analysis. It is worth noting that Title 25 is lengthy (more than a thousand pages in its unofficial format), extremely complex, and, like most statutes, it has been modified incrementally over time.

As a side note, a comprehensive review process to “clean up” the statute is likely overdue and could serve to improve governmental public health agencies understanding and compliance with Colorado’s Public Health laws.

Further, our review suggests that there may be some minor state mandated activities that were not captured in the existing CPHS operational definitions. Because CPHS are intended to include all state and federally mandated activities, it is important that a review is done to ensure consistency between statute and the CPHS operational definitions.

High-Level Methodology

The CPHS Needs Assessment data collection and validation process was conducted between January and August 2019 which generated a rich and comprehensive database of programmatic and financial information.

This primary data set was used, in conjunction with secondary data described previously, to generate an understanding of the current, statewide implementation and spending on CPHS and estimate the cost of fully delivering them statewide based on the current service delivery paradigm, as per the project purpose.

The Needs Assessment used mixed methods of analysis to generate a holistic picture of the governmental public health system’s current state and future needs related to full implementation of CPHS.

The analyses conducted using these combined data sets include synthesis and thematic analysis, qualitative analysis of programmatic governmental public health agency self-assessment data, and financial analysis.
Synthesis and Thematic Analysis

Many of the results and findings within this Report, are a synthesis of the extremely large, complex primary data set collected. As such, this Report presents the most up-to-date and comprehensive summary of Colorado’s current governmental public health system, and its governance, service delivery system, and, at an individual agency-level, revenues and fees.

In some cases, this synthesis was augmented by the secondary sources also used in this Report.

This Report also includes many results and findings from a thematic analysis, by which patterns were identified, analyzed, and interpreted to improve overall understanding of the situation through both quantitative and qualitative data.

An inductive approach was used for this analysis, whereby the primary data is used to generate overarching themes based on an evaluation of results at the individual respondent level. The thematic analysis identified key findings related to several topics:

- Changes faced by governmental public health agencies in 2018
- Security and predictability of revenue sources
- Non-financial barriers to implementation
- Barriers to service access
- Existing or natural sharing partners
- Types of fees charged
- Willingness to share services
- Benefits of local delivery of services
- One-time implementation costs related to full implementation of CPHS
- Interest in PHAB Accreditation

Specific methodological notes for each of these thematic analyses are provided, as needed, in their respective sections of the Overall Report.

Programmatic Self-Assessment Analysis

The programmatic self-assessment results provide an overall indicator of the size, location, and nature of the gaps in capacity and expertise, implementation, and service to Coloradans that currently exist in the provision of CPHS throughout Colorado.

It is important to remember that LPHAs capacity and expertise scores, as well as the results of the analysis of these scores, are not intended to be evaluative. Rather, the results communicate the capacity and expertise, level and degree of implementation, and population by level of service of CPHS that is available today, based on existing resources.

Further, the assessment is based on the newly redefined version of CPHS based on the national FPHS framework.

These results can be used in conjunction with the current spending analysis to understand the spending needed to achieve the current capacity and expertise, level of implementation, and population by level of service at an agency and systemwide perspective for 2018.

Elements and Activities-level

As described in Appendix D: Needs Assessment Data Collection and Validation Process, governmental public health agencies self-assessed the capacity (the staff or other labor resources with the ability and associated materials and supplies) and expertise (the appropriate knowledge and skills) with which the public health elements and activities they govern are delivered in their communities, using a Likert scale from one to five as shown in Exhibit 13.

Governmental public health agencies were asked to self-assess both capacity and expertise, in recognition that there is a difference between the resources needed (capacity) and the knowledge (expertise) needed for full implementation of CPHS.

In other words, there are activities where an agency may have the expertise or knowledge to do the work, but may not have the resources (high expertise, but low capacity), and that there are some services where an agency may have flexibility in resources but

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23 A Likert scale is a rating scale used in survey research designed to measure how people feel about something. The responses have rank order but the steps between the scale values are not presumed to be equal.
those resources may not have the appropriate knowledge, skills, or training (low expertise, high capacity).

As shown in Exhibit 13, the self-assessment rubric is not linear; that is, a score of 1 on the likert scale doesn’t mean the element or activity is 0 to 20% implemented, nor does a score of 5 on the likert scale mean that the element or activity is 80 to 100% implemented.

Rather, the scores directly map to the rubric as ordinal values, such that a score of 1 means that the activity is not being provided and a score of 5 means the element or activity “fully meets requirements”.

Because the rubric is not linear, there is a clear critical-value mid-range (score of 3) which represents a break, where capacity and expertise meet a “basic” standard, albeit at a lower level of service or with a meaningful gap in skills or knowledge.

To communicate this break, when visualizing results based on this data, we use a divergent color scheme, which puts equal emphasis on both ends of the data range. In this divergent color scheme, the low and high extremes are emphasized by dark colors with contrasting hues and the critical break in the middle results is emphasized with light colors.

### Exhibit 13. Self-Assessment Rubric

<table>
<thead>
<tr>
<th>CAPACITY</th>
<th>EXPERTISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Currently Provided</td>
<td>Not Currently Provided</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Able to Provide the Basics at</td>
<td>Meaningful Gap in Skills or Knowledge</td>
</tr>
<tr>
<td>a Lower Level of Service</td>
<td>3</td>
</tr>
<tr>
<td>Fully Meets Requirements</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

Source: Habile, 2019.
Level of Implementation

Level of implementation is a description of the extent to which elements and activities are implemented in each governmental public health agency’s jurisdiction based on the capacity and expertise with which the activities are delivered. This is irrespective of who delivers the service [CDPHE for the state overall or the local jurisdiction’s LPHA, or another agency].

Exhibit 14 illustrates how programmatic self-assessment scores are interpreted to communicate level of implementation, with expertise on the y-axis and capacity on the x-axis, to provide insight into governmental public health authorities’ level of implementation.

As a reminder, level of implementation scores are not intended to be evaluative. They merely communicate the level at which CPHS elements and activities can be implemented within existing resources.

Exhibit 14. Level of Implementation Rubric for Elements and Activities

- **Significant Implementation:** The element or activity is mostly or fully implemented.
- **Basic Implementation:** The element or activity is implemented at a basic level, but with a meaningful gap in level of service.
- **Limited Implementation, Low Expertise:** The element or activity is implemented on a limited basis, and while the governmental public health agency has significant capacity, there are substantial gaps due to a meaningful gap in skills or knowledge.
- **Limited Implementation, Low Capacity:** The element or activity is implemented on a limited basis, and while the governmental public health agency has significant expertise, they do not have enough capacity to utilize that expertise.
- **Limited Implementation:** The element or activity is limitedly implemented and there are significant gaps in capacity and expertise.
- **Minimal Implementation:** The element or activity is mostly not or not at all implemented.

Source: Habile, 2019.
Population by Level of Service

Population by level of service describes how the level of implementation of elements and activities at a governmental public health agency-level translates to the level of service a population receives.

Exhibit 15 illustrates how programmatic self-assessment scores are interpreted to communicate population by level of service, with expertise on the y-axis and capacity on the x-axis, to provide insight into governmental public health authorities’ level of implementation.

As a reminder, level of service scores are not intended to evaluative. They merely communicate the level of service at which the population is being served for each element and activity based on existing resources.

Source: Habile, 2019.

Exhibit 15. Population by Level of Service Rubric for Elements and Activities

- **Services Mostly Available**: The services represented by this element or activity are mostly or fully implemented and serve/represent most or all residents.
- **Basic Services with Meaningful Gaps**: The services represented by this element or activity is implemented at a basic level, but with a meaningful gap in level of service.
- **Limited Services**: The element or activity is implemented on a limited basis and there are significant gaps in capacity and expertise.
- **Services Minimally Available**: The element or activity is mostly not or not at all implemented.
Foundational Capability or Service and Function-level

Governmental public health agencies were asked to self-assess the capacity and expertise with which the public health elements and activities they govern were delivered in their communities, using a Likert scale. Specifically, they were directed to not consider functions as part of the self-assessment of the services that they provide.

Since the definitions nest or “roll-up”, such that the foundational capabilities and services, and functions, are further defined by the elements and activities; scoring at both levels would be duplicative.

This would have likely led some disagreement between scores at each level, adding an additional challenge to the data validation process. Instead, it was assumed that the element and activity scores would “roll-up” to generate appropriate scores for the foundational capabilities and services, and functions.

However, in order to understand the extent that individual foundational capabilities and services and functions are implemented based on the more detailed element- and activity-level self-assessment data, a composite score for the foundational capability or service or function is necessary.

We elected to use a weighted average based on full implementation costs to generate aggregate scores. This aggregation adds a third dimension, resource need, to the understanding of the extent to which elements are implemented.

This is important because the elements and activities are not all the same “shape and size”; that is, fully implementing some of the activities might be a much larger or more significant endeavor than others.

The tabulated composite scores were truncated to one-tenth of a point to be conservative relative to their implied meaning (that is, scores were never rounded up).

The composite score condenses multiple datapoints into one, and, as such, some details are lost. However, the resulting composite score is an interval score that provides meaningful information on the degree of implementation relative to full implementation.

While this makes intuitive sense, the process of creating a “roll-up” score is presented a challenge. Since the self-assessment scores from the activities and elements represent ordinal data, strictly speaking, it can be problematic to simply aggregate the data, even when measured on the same scale, as in this case. This is because the aggregation is effectively eliminating some qualifying information from the score.
Degree of Implementation

Degree of implementation describes the extent to which foundational capabilities and services and functions are implemented in each governmental public health agency’s jurisdiction. This reflects the “roll-up” composite scores based on the level of implementation of the elements within each and without consideration for who delivers the service.

Exhibit 16 illustrates how these composite scores are categorized to communicate degree of implementation.

It is worth noting that the level and degree of implementation rubrics use parallel language. This is intentional, as it allows for qualitative comparison among the different definitional components, such that readers can intuit why each foundational capability or service or function is at the degree of implementation it is based on the elements that make it up.

As a reminder, degree of implementation scores are not intended to evaluative. They merely communicate the degree to which CPHS functions are able to be implemented within existing resources.

Exhibit 16. Degree of Implementation Rubric for Foundational Capability or Service and Function-level

- **Significant Implementation**: The foundational capability or service or function is mostly or fully (75 to 100%) implemented, based on the implementation of its elements and activities.
- **Basic Implementation**: The foundational capability or service or function is implemented at a basic level (50 to 75%), but with a meaningful gap in implementation of one or more of its elements and activities.
- **Limited Implementation**: The foundational capability or service or function is implemented to a limited degree (25 to 50%) and there are significant gaps in implementation of one or more of its elements and activities.
- **Minimal Implementation**: The foundational capability or service or function is mostly not or not at all (0 to 25%) implemented because most, if not all, of its elements and activities are mostly not or not at all implemented.

Source: Habile, 2019.
Interpreting Programmatic Self-Assessment Analysis

It’s important to remember that while our results describe how implemented elements and activities are in each governmental public health agency’s jurisdiction based on the capacity and expertise with which the activities are delivered, it doesn’t make any effort to understand what that capacity and expertise “buys” in terms of work being completed or access to services being provided to residents.

That is, anything below full implementation could refer to not all pieces of the element or activity work being implemented, the element or activity work not being implemented on behalf of everyone, or any combination of the two.

Understanding what implementation “buys” would require connecting data around capacity and expertise (and with it level and degree of implementation and population level of service) to process measures related to the experience of these activities by the community (that is, what the community receives as a function of these activities being implemented).

This is likely to be extremely complex as most of the types of services (i.e., population-based, infrastructure-building, and overhead services do not have a direct or indirect benefit to individual residents).

The primary dataset includes empirical evidence confirming that regardless of level or degree of implementation or level of service, services that have a direct or indirect benefit to residents have gaps in service availability. The evidence also demonstrates that there may continue to be service access even if CPHS were fully implemented.

There are two reasons for this. First there are meaningful non-financial barriers to service access that won’t be addressed by implementation of CPHS alone. In fact, the governmental public health system may not be able to do anything about some of these service barriers. These barriers to service access are discussed in the Overall Report, Results, Needs for Achieving Full Implementation of CPHS section.

Secondly service needs are asymptotic. That is, service needs can never be truly met, even as they approach their limits. This is because fulfillment of service needs generally leads to discovery of additional service needs.

The current programmatic self-assessment analysis is useful to understanding the work governmental public health agencies have in front of them to achieve full implementation of CPHS. However, it is a deficit-based approach. Understanding what implementation “buys” would put this in an asset-based perspective, that would help communicate why implementation of CPHS is needed to the public, policy makers, and potential funders.

Financial Analysis

The primary dataset includes systemwide data on revenues and fees collected by LPHAs. This is augmented by secondary data from CDPHE’s own financial reporting for State Fiscal Year (SFY) 2018 and SFY 2018 and FY 2018 data from CDPHE’s CORE accounting grants and contracts ledger.

The primary dataset also includes allocations of (S)FY 2018 spending and full implementation cost estimates for each governmental public health agency for each CPHS function, as well as data on one-time implementation costs related to CPHS implementation at the function-level.

Habile estimated the statewide current spending and estimated cost of fully implementing CPHS at the function- and foundational capability and service-level using the primary dataset. In narrow cases, we refined the results through limited standardization to correct for validated outliers. This is because the validation process attempts to identify all outliers and explain them, while respecting individual LPHA perspectives and logic such that the final dataset may have features that, extrapolated across the system, could affect the validity of the final statewide estimate.

Statewide current spending was subtracted from the estimated cost of fully implementing CPHS at the function- and foundational capability and service-levels to estimate the
**REVENUE ANALYSIS**

On pages 8 through 13 of this Report, we present a high-level summary of Colorado’s existing governmental public health funding paradigm. Overall governmental public health system revenues have, both historically and currently, not been tracked on a systemwide basis. As such, our ability to understand the overall funding to the governmental public health system by contributor, as well as the overall flexibility, security, and predictability of funding, is limited. Similarly we don’t have sufficient data to understand longitudinal patterns in funding.

While we collected agency-level data on governmental public health system revenues, it is very difficult to generate a systemwide picture from those values, without overstating the revenues available to be spent “on the ground.” This is because many revenues “pass through” multiple governmental public health providers before they are spent “on the ground.” It is extremely difficult to prevent double counting of “pass through” or contract dollars that flow between CDPHE and LPHAs and among LPHAs.

As such, the revenue analysis presented in this Report is at the agency-level, rather than systemwide.

With additional primary research (largely qualitative) the data collected during the Needs Assessment Data Collection process could be used to generate such a summary.

Additional increment of cost of reaching full implementation. This “additional increment” represents the additional spending that would need to occur to achieve the incremental increase in capacity and expertise to support full implementation of CPHS statewide. This “additional increment” does not represent the additional revenues needed to fully implement CPHS, as that value is dependent on alignment of funding responsibilities and the security, predictability, and flexibility of existing revenues as discussed later in this Report.

While the order of magnitude of this analysis largely negated any outliers and standardization provided only an additional check against respondent estimates, we elected to present the final full implementation cost and additional increment of cost estimates, as a range, with a contingency to address the potential variability of the results. In addition, the final results were rounded to the nearest $1,000, so as not to overstate the level of precision of the results.

These values are all presented in current year dollars (appropriately 2018 or 2019 dollars). While there is minor variation between these two periods, because they are adjacent and represent a small period of time, we felt it was more accurate not to inflation adjust 2018 values to 2019 purchasing power and vice versa. Any purchasing power differences between the periods are likely to be nominal. If the results of this analysis were to be inflated for comparability in future years, they should be inflated from 2018 purchasing power.

The financial results presented in this Report represent point-in-time, planning-level estimates based on the assumptions laid out previously. It is important to remember that some of these assumptions, namely the programmatic framework, are not static because of the evolving nature of public health work, which will need to be reflected in future updates to the CPHS framework and operational definitions.

Further, these results are based on the current service delivery paradigm, which may be optimized to increase efficiency and effectiveness as part of the broader public health system transformation effort. When considering these results in the future, adjustments should be made to ensure that they are comparable with current assumptions and purchasing power.

Further, this Needs Assessment is an early step in an evolving public health system transformation effort. It is likely that these results will continue to be refined as implementation progresses.

**Cross-tabulation**

The Needs Assessment considered the entire State of Colorado, however, we identified that there may be instances where drilldown results for individual governmental public health agencies
(CDPHE and LPHAs) and subsets of LPHAs based on their characteristics, as well as characteristics of the communities they serve, were useful. To accomplish this, we cross-tabulated the results based on several community and governmental public health agency characteristics. As this Report is intended to identify needs related to CPHS implementation, we selected characteristics, namely LPHA structure that might be relevant to understanding current implementation within the existing governmental public health system or needs for full implementation under a future system where the governance and service delivery paradigm might be different.

We also wanted to put our results and findings in the context of the population being served; that is, we wanted to understand the real world impacts of current implementation and needs for full implementation of CPHS on Coloradans. FPHS (CPHS) needs assessments completed by other states and national literature suggest that population and poverty rate are the most statistically significant drivers of the cost of delivering FPHS (CPHS); that is, that they may be predictive in estimating the costs of FPHS (CPHS). As such, we selected population and
poverty rate as two additional criteria for cross-tabulation.

Population is a unique criteria, in that it is both a characteristic of the community and a characteristic of the governmental public health agency (as we class LPHAs by size and, in some cases, consider the population density they serve – frontier, rural, or urban).

Based on the populations they serve (size) poverty rate as two additional criteria for cross-tabulation.

Colorado’s LPHAs have an asymmetric distribution, with 35 extra-small LPHAs (66% of 53 total) serving less than 7% of the population as of 2018.

Along with population, we incorporated population density into our syntheses and thematic analyses, as LPHAs stressed throughout this process that the challenges faced by rural and frontier communities are different and unique from the challenges in urban communities.

We also considered poverty rate within our cross-tabulation, both because it was identified as predictive in estimating the costs of FPHS (CPHS) but also as a proxy for service equity based on social determinants of health (i.e. is the population being served equitably regardless of social determinants?).

This is imperfect, as social determinants are much more complex than one metric can communicate, however, poverty rate is so closely correlated with many other social determinants (like race and ethnicity, educational attainment, etc.) that it is a good initial proxy.

Before any analysis has even been done, the cross-tabulation is useful to provide context on the initial system. Namely, what is obvious, is that, from a geographic standpoint, most of Colorado is rural or frontier, with the main urban areas in the Denver Metropolitan Area, Colorado Springs, and Grand Junction. However, poverty is an issue throughout the state, with the Denver Metropolitan Area having some census tracts with the lowest poverty rates (although there are also some high-poverty Census tracts in the Denver Metropolitan Area).

When reviewing the results of this analysis, it’s important to remember correlation is not necessarily an indicator of causation. As a result the analysis intentionally focuses on characteristics where the which are less likely
to imply specific causality. For example, the analysis is not designed to determine that low levels implementation of CPHS was causing poor health outcomes or, conversely, that the general health condition of a particular community was generating higher needs for CPHS.

Presentation of Results and Findings

Audience

This report was written for two key audiences:

- **Broad Policy Audience.** This audience may include federal-level legislators like Colorado’s congressional delegation and representatives and state-level executive and legislative policy makers like the governor and Colorado General Assembly members, as well as the State Board of Health and other state-level boards and commissions.

- **Governmental Public Health System Leadership and Staff.** This audience includes the leadership and staff of CDPHE and all 53 LPHAs as well as other important participants in the governmental public health system, like Denver Public Health and Northwest Colorado Health.

It may also include leadership and staff of the counties served by Colorado’s 53 LPHAs. Some of this leadership, in particular, the CDPHE director but in some cases also LPHA directors, may be selected via political appointment.

This audience also includes Colorado’s public health-related professional associations, re-emerging under the umbrella of the Public Health Alliance of Colorado, including CALPHO, the Colorado Directors of Environmental Health (CDEH), Colorado Environmental Health Association (CEHA), Colorado Public Health Administrators (CoPHAD), Colorado Public Health Association (CPHA), Colorado Public Health Nursing Leaders (CPHNL), Colorado Society for Public Health Education (COSOPHE), Public Health Nurses Association of Colorado (PHNAC), Western Colorado Association of Environmental Health Officers (WCAEHO), and Colorado Association of Local Boards of Health (CALBOH).

These audiences are both extremely diverse and likely to have different interests and uses for the CPHS Needs Assessment.

Report

The CPHS Needs Assessment was extremely comprehensive, with a breadth and depth of results and findings. To ensure that those results and findings are elevated as part of this work, we sought to develop a final product, a report, that would provide a level of detail that balances meaning and analytic value with function and usability.

Recognizing the complexity of this work, we also wanted to provide results and findings that could be appropriately interpreted by our audiences, to minimize the risks possible from providing governmental public health agency-level detail without appropriate governmental public health agency-level context.

It is unlikely that a single, inflexible report would meet the needs of both diverse audiences for which these results and findings are intended. Instead, we elected to develop a flexible product with many versions appropriate to the different audiences. These versions include an Executive Summary Report, Overall Report, and Full, Detailed Report.

Further, we anticipate these reports will be distributed and accessed in both print and digital formats. The report versions, as well as the variation between the print and digitally formatted versions, are described at the beginning of this Report, on the Report Versions and Contents page.
Presentation of Data, Results, and Findings

Throughout this report, we use information and data visualizations to visually communicate a breadth and depth of information, maximizing insight and generating results and findings that are easily digestible for a range of audiences. This includes use of:

- **Graphic Frameworks, Charts, and Tables.** Many of the ideas, results, and findings generated by this Needs Assessment are presented in this Report as graphic frameworks, charts, and tables, with key points outlined in bullets throughout the subsequent narrative. This display of information is designed to make it easier to aggregate complex data and identify key findings.

  Specific instructions for interpreting this information and these data visualizations are provided, as needed, in their respective sections of the Executive Summary, Overall Report, and Detailed Report, as well as in the Appendix D: Detailed Needs Assessment Data Collection and Validation Process and Methodology.

- **Maps.** In addition to the tabular display of data, we have provided maps to illustrate a few key points of the analysis where an understanding of geography or variation across the governmental public health system is especially relevant. Again, key points are outlined in bullets throughout the subsequent narrative.

  The maps used throughout this report use a mercator projection (a projection of the map onto a cylinder where the parallels of latitude have the same length as the equator) to allow for comparability with mapping in other Colorado public health system reporting, including CDPHE’s open data portal.

  Use of this projection may slightly distort the sizes of the individual LPHAs, such that it is difficult to accurately visually compare their sizes. This is true anyway, due to their irregular and incomparable shapes.

  Where features of the geography are most relevant (for example, when considering population density), the ArcGIS “terrain with labels” basemap, which shows major topographic and charted features of the geography, is used.

  In other cases (for instance, in the case of the many choropleth maps used throughout this report). In other cases, like in the case of chorolet maps, no basemap is used.

  Specific instructions for interpreting particular maps are provided, as needed, in their respective sections of the Executive Summary, Overall Report, and Detailed Report, as well as in the Appendix D: Detailed Needs Assessment Data Collection and Validation Process and Methodology.

**Colors**

Color is used in many of the data visualizations throughout this report. The color scales used, are described with the methodology related to the information they communicate. In particular, within the programmatic analysis, two different color scales are used, a divergent scale and a sequential scale.

These color scales were developed using Color Brewer 2.0 an online tool that provides color advice for cartography. The color scales were designed to be print- and color blind-friendly, and to have the same terminus. However, the color scales are not intended for photocopy.

**Limitations**

As with any analysis, needs assessment or otherwise, there are potential limitations to the analysis. Both these limitations and any mitigating factors are described, following:

First, we attempted to bound this Needs Assessment to the activities, revenues, and expenditures of the governmental public health system. This was a challenge, as governmental public health agencies are commonly subordinate to overall governmental entities (the State of Colorado, in the case of CDPHE, and, commonly, counties in the case of LPHAs).

These relationships are highly variable, and include both direct and indirect contributions, some of which are provided in-kind (which can be difficult to value). We worked to bound
our analysis to include only those costs that might reasonably incurred by a “typical” governmental public health agency.

Secondly, the analysis is limited to the current implementation and spending on, and the full cost of implementation of CPHS. The review of Colorado public health and environment statute (Title 25) suggests that there may be some minor state-mandated activities that were not captured in the existing CPHS operational definitions.

CPHS are intended to include all state and federally mandated activities, so the financial analysis completed in this Report might understate the current spending on and full costs of CPHS. As such, it is important that the costs in this report be appropriately qualified as the current spending and full costs of CPHS per the November 2019 final CPHS Operational Definitions.

Additionally, CPHS are a subset of overall public health activities that are “needed everywhere to work anywhere.” Beyond CPHS, there are other critical public health services, that are no less important than CPHS, however variation in their delivery (based on state and community priorities and service delivery where they may be delivered by entities beyond the governmental public health system) means they would be difficult to define and quantify.

This is a limitation because these are anticipated costs to the governmental public health system that are not measured in this analysis (and therefore, we need to be careful to communicate that this Needs Assessment only captures costs related to some of the governmental public health system’s funding needs).

It is also a limitation there may be an unaccounted for portion of foundational capabilities that represent the additional variable increment of capabilities needed to fully implement state and local priority services (referred to as the “additional increment of foundational capabilities attributable to state and local priority services”).

These “additional important capabilities should be included in the full cost of CPHS, but cannot be quantified without first defining state and local priority services. As of this Report, no significant effort has been made to do this, so the Needs quantified in this Report are limited to CPHS, without “additional important capabilities.”

Thirdly, as part of this Needs Assessment, we assessed level and degree of implementation and level of service to the population of CPHS based on governmental public health agencies’ self assessment scores. The findings (that is, level and degree of implementation and level of service to the population for specific CPHS) are not intended to be evaluative; they merely communicate the level and degree at which CPHS can be implemented, and the level at which the population is being served, within existing resources.

Further, this analysis doesn’t make any effort to understand what capacity and expertise (through the lens of level and degree of implementation and level of service to the population) “buys” in terms of work being completed or access to services being provided to residents.

That is, anything below full implementation could refer to not all pieces of the element or activity work being implemented, the element or activity work not being implemented on behalf of everyone, or any combination of the two.

Fourth, while the financial analysis relies on the validated primary dataset, we recognize the limitations of validation. That is, the validation process attempted to identify all outliers and explain them, while respecting individual LPHA perspectives and logic.

As a result the final validated primary dataset may have features that, when included in system-level results, may have a minor impact on the final statewide estimates. To address this concern, in a few instances, the agency level results were adjusted through limited standardization, but only for the purpose of supporting the statewide estimates. All of the analyses conducted at the agency level use the final validated data.
Limitations of Primary Dataset

As with any data collection process, there are certain inherent limitations to the resultant primary dataset. Some of these limitations, are also limitations of the overall Needs Assessment process and, along with their mitigating factors, were discussed immediately preceding this section.

There are some limitations that are specific to the data collection process and primary dataset. Specific limitations and mitigation factors are described in detail in Appendix D: Needs Assessment Data Collection and Validation Process, Limitations. The following is a brief summary of these issues:

- **Reliance on self-reported data.** The data in the primary dataset is self-reported; as with all self-reported data, there is the potential for respondent bias.
  - Respondents may also have a difficult time accurately assessing their own capacity and expertise.
  - Respondents also had to self-assess the capacity and expertise with which CPHS elements and activities they govern are delivered in their communities, rather than just their capacity and expertise as an agency.
  - This was extremely challenging for many LPHAs. Despite validation, we anticipate that some LPHA scores may more accurately reflect their agencies’ abilities than the capacity and expertise with which elements and activities are delivered for their community (including by others).

- **Use of the nascent CPHS framework and operational definitions as the Needs Assessment programmatic framework.** The CPHS operational definitions are still very new, to the point that they are not yet accompanied by minimum quality standards. They are also extremely detailed and complex.
  - Respondents may have interpreted components of the CPHS framework and operational definitions differently. Further, CDPHE and LPHAs’ existing accounting and reporting structures may not match this new service.
  - Building a shared understanding of the CPHS framework and operational definitions, and creating infrastructure alignment, is likely to be an ongoing process.

- **Collection of data from 56 disparate agencies (CDPHE, 53 LPHAs, and close system partners Denver Public Health and Northwest Colorado Health) may lead to variation in data among respondents.** Respondent agencies have different fiscal years, accounting methods, and FTE definitions. Aggregation of this data may invite duplication and gaps in system-level understanding.

- **Point-in-time estimates may not fully capture the potential for annual variability in services related to surge and emergency response, cyclical services, or capital costs.** Additionally, some agencies faced changes and challenges in (S)FY 2018 that could be considered outside the range of “normal,” potentially impacting the reliability of the period as a “normal” year.

- **Diversity of respondents with differing levels of financial acumen and cost estimation experience.**

- **Labor intensive nature of data collection process and difficult timing for LPHAs.** The CPHS Needs Assessment data collection and validation process was extremely complex. It was also extremely labor intensive for LPHAs. LPHAs expressed that the timing was difficult as LPHA budgets are due to local boards of health by September 1st.

Knowing that technical assistance has an inverse relationship with data validation (the more technical assistance provided the less need for data validation later on) we implemented comprehensive technical assistance to support robust data collection despite these limitations. We also validated this data to ensure that it was accurate to the desired order of magnitude.

The data collection process-specific limitations (the limitations of the primary dataset) and their mitigating factors are discussed further in Appendix D: Data Collection and Validation Process, Limitations.
Results
Existing Governance and Service Delivery Paradigm

Existing Governance and Service Delivery Paradigm

In Colorado, Governmental public health is decentralized such that the Coloradan’s are served by both a state agency (CDPHE) and LPHAs where local governments, primarily counties, retain authority over many decisions related to their budget, public health orders, and the appointment and employment of local health officials.

Largely, governance and delivery of governmental public health services is bifurcated such that the state agency delivers a subset of services centrally to all Coloradans, while LPHAs deliver other services locally (in a decentralized manner), within their service areas.

State-level Governmental Public Health

State Public Health Agency

First created in 1947, Colorado’s state health department was renamed CDPHE in 1994. Headquartered in Glendale, Colorado, the department provides both traditional state public health services, like wellness promotion and vital records management, as well as environmental protection services, like water and air quality monitoring.

CDPHE is one of only a few state health departments with combined human and environmental health responsibilities and services.

CDPHE’s powers and duties are outlined in C.R.S. Title 25, section 1.5, and are incredibly complex, spanning over six parts with a collective 54 subsections. As evidenced by the notes, this complexity is largely a function of the historical evolution of the agency; the statute could be revised to more succinctly and clearly lay out CDPHE’s powers and duties.

CDPHE is led by an executive director appointed by the governor. This is notable as it politicizes the leadership of the agency. This politicization may present a challenge to the governmental public health system, in that it may lead to increased turnover in CDPHE leadership (with each gubernatorial transition), which is a significant challenge given the influence of the position.

In addition, various aspects of CDPHE operations are governed by State Boards and Commission.

State Board of Health

Colorado’s State Board of Health (State Board) is made up of nine members, appointed by the governor with the consent of the Senate, one for each congressional district and two at-large members. One member must also be a county commissioner and statute prohibits a super majority from a single political party (that is, no more than five board members from a single political party can participate on the State Board at a given time)24.

The State Board promulgates rules related to governmental public health in Colorado, which are codified in the Code of Colorado Regulations (CCR). Adopted rules cover wide range of public health subjects, including: CPHS and minimum quality standards for CPHS and LPHA public health directors and medical officers.

The Board also oversees the development and implementation of the statewide PHIP, reviews all LPHA public health plans, approves funding and allocations for public health grant programs, makes appointments to CDPHE’s departmental committees, and advises CDPHE’s executive director, as appropriate.

Although statute does summarize the State Board’s duties, as in the case of

24 C.R.S. 25-1-103
CDPHE, the detailed powers and duties of the State Board are incredibly complex, appearing throughout C.R.S. Title 25. Again, this complexity is not by design, but rather, a function of the historical evolution of state-level governmental public health activities in Colorado. The statute could be revised to more succinctly and clearly lay out the State Board’s powers and duties.

In addition to the State Board, CDPHE and statewide governmental public health activities are governed by additional rulemaking boards and commissions, including:

- Air Quality Control Division
- Solid and Hazardous Waste Commission
- Water and Wastewater Facility Operators Certification Board
- Water Quality Control Commission

In addition, CDPHE’s executive director has the authority to promulgate certain rules.

These rulemaking bodies are all charged with protecting different aspects of Colorado’s public and environmental health. The relationships between the State Board and these other rulemaking boards and commissions are somewhat ambiguous, although their end purpose (protecting Colorado’s health and environment) is aligned.

Beyond rulemaking boards and commissions, CDPHE operates, manages, and is advised by 35 boards, commissions, committees, councils, task forces, and working groups that do not have rulemaking authority. These additional bodies are:

- Assisted Living Advisory Committee
- Behavioral Health Entity Implementation and Advisory Committee
- Breast and Cervical Cancer Screening Program (BCCSP) Advisory Board
- Colorado Chemical Demilitarization Citizens’ Advisory Committee
- Cancer, Cardiovascular, and Chronic Pulmonary Disease (CCPD) Grant Program Review Committee
- Colorado Commission on Affordable Health Care
- Colorado Coroners Standards and Training Board
- Colorado Medical Directors Advisory Committee
- Dialysis Treatment Clinic Advisory Committee
- Emergency Medical Practice Advisory Council (EMPAC)
- Emergency Preparedness and Response Public Health and Medical Advisory Committee
- Facilities for Persons with Developmental Disabilities Advisory Committee
- Governor’s Expert Emergency Epidemic Response Committee (GEEERC)
- HB 1294 Stakeholder Forum
- Health Care Associated Infections Advisory Committee
- Health Equity Commission
- Health Facilities Occurrence Advisory Committee
- HIV and AIDS community involvement, communities, and groups
- Colorado HIV Alliance for Prevention, Care, and Treatment
- HIV Testing Working Group
- Pre-exposure Prophylaxis (PrEP) Working Group
- People Who Inject Drugs (PWID) Working Group
- Colorado HIV and AID Prevention Grant Program (CHAPP) Advisory Committee
- Home Care Information Exchange
- Hospital Chapter 4 Licensing Rule Revision Meeting
- Long Term Care (LTC) Advisory Committee
- Medical Marijuana Scientific Advisory Council
- Pollution Prevention Advisory Board
- Radiation Advisory Committee
- Regional Emergency Medical and Trauma Advisory Councils
- Retail Marijuana Public Health Advisory Committee
- Small Business Assistance Program Compliance Advisory Council (SEMTAC)
- ST-Elevation Myocardial Infarction Task Force (STEMI) Task Force
- Stroke Advisory Board
- Suicide Prevention Commission
- Tobacco Grant Program Review Committee

These non-rulemaking bodies each have different charters and charges (some of these charters and charges are formal and explicit, while others are informal and implicit) and, on
that basis, different roles and relationships to CDPHE and the broader governmental public health system.

Some of these non-rulemaking bodies are advisory, some review grants and other applications, some manage standards and training for specific programs, and still others provide a venue for ongoing stakeholder and community engagement.

In addition, there can be confusion when efforts among the various rulemaking and non-rulemaking bodies intersect and there are no explicit protocols or practices that define how these parties should collaborate or coordinate.

**Air Quality Control Commission**

The Air Quality Control Commission is made up of nine commissioners, with appropriate scientific, technical, industrial, labor, agricultural, and legal training, appointed by the governor with the consent of the senate. The Commission oversees Colorado’s air quality program, per the Colorado Air Pollution Prevention and Control Act. Specifically, the Commission adopts and promulgates through administrative rule, a cost-effective and efficient air quality management program to promote clean and healthy air in Colorado.

The Commission also promulgates emission control regulations, a prevention of significant deterioration program, and rules and regulations related to statewide greenhouse gas pollution abatement.

In carrying out these duties, the Commission is expected to consult with local governments and any federal land manager with authority over federal land to which the state air quality management program applies. This consultation should include discussion of transportation management, air quality maintenance plan requirements, preconstruction review of stationary sources of air pollution, and any measure referred to in the prevention of significant deterioration program.

**Solid and Hazardous Waste Commission**

The Solid and Hazardous Waste Commission is made up of nine commissioners, three from industry, three members from local government or academia, and three members of the public-at-large, appointed by the governor with the consent of the senate.

The Commission promulgates rules related to the storage, treatment, and disposal of hazardous waste; regulations related to administration and compliance activities related hazardous waste; standards related to the generators of and hazardous waste; and fees related to facilities that threat, store, or dispose of hazardous waste. The Commission also promulgates rules for solid waste disposal sites.

**Water and Wastewater Facility Operators Certification Board**

The Water and Wastewater Facility Operators Certification Board is made up of ten members, including: a certified water treatment or domestic wastewater treatment facility operator; a certified industrial wastewater treatment facility operator or other representative of a private entity that operates an industrial wastewater treatment facility; a city manager, manager of a special district, or utility manager in a city, county, or city and county that operates a domestic water or wastewater treatment facility; a representative of CDPHE (who shall be an ex officio, nonvoting member); a certified water distribution or wastewater collection system operator with the highest level of certification available in Colorado; a representative of water or wastewater facilities serving rural areas; and four members appointed to achieve geographical representation and reflect the various interests within the water and wastewater facility certification program. Members are appointed by the governor with the consent of the Senate.

The Water and Wastewater Facility Operators Certification Board provides for the examination, classification, and certification of water and wastewater facility operators. As part of this, the Certification Board establishes minimum standards for operator knowledge and experience and education to ensure that all water and wastewater facilities are managed by an appropriately knowledgeable “certified operator.”
The Certification Board is also responsible for classifying water and wastewater facilities statewide and penalizing any facilities operating without a “certified operator.”

**Water Quality Control Commission**

The Water Quality Control Commission is made up of nine commissioners, reflecting geographic representation (including two representatives from west of the Continental Divide) and various water-related interests, appointed by the governor with consent of the senate.

The commission is charged with developing and maintaining a comprehensive and effective program for prevention, control, and abatement of water pollution and for water quality protection throughout the entire state and, to ensure provision of continuously safe drinking water by public water systems.

In the course of this work, the Commission is expected to and exercise the incidental powers necessary to enforce these rules and orders. It is also expected to advise, consult, and cooperate with other governmental agencies and industries affected by its work.

**Local-level Governmental Public Health**

**Local Public Health Agencies**

As discussed previously, the 2008 Public Health Act obligated each of Colorado’s 64 counties to establish and maintain a single county LPHA or to participate in a district local public health agency. Colorado’s 64 counties are currently served by 53 LPHAs, with varying governance structures, as shown in Exhibit 20.

In contrast to those of CDPHE, LPHA’s powers and duties are succinctly summarized in C.R.S. 25-1-508 (3).

LPHAs’ powers and duties include25:

- Arranging for the provision of services

"We continue to believe that governmental public health services are best provided locally and that the State of Colorado ought to support local governance and service delivery efforts as much as possible."

— Medium LPHA
Single County LPHAs: Deliver decentralized services to a single county. In a county with a population less than 100,000, single county LPHAs may be governed by either the Board of County Commissioners or a separate Board of Health with at least three members appointed by the Board of County Commissioners.

Single County LPHA subordinate to County Health and Human Services Department: Deliver decentralized services to a single county, as part of the activities of the county’s broader Health and Human Services department. In a county with a population less than 100,000, single county LPHAs may be governed by either the Board of County Commissioners or a separate Board of Health with at least three members appointed by the Board of County Commissioners.

Single County LPHA coordinating with a Quasi-governmental Agency: Deliver decentralized services in a single county, in cooperation with a Quasi-governmental agency. In a county with a population less than 100,000, single county LPHAs may be governed by either the Board of County Commissioners or a separate Board of Health with at least three members appointed by the Board of County Commissioners.

Single County LPHAs with Contractual Arrangements to Provide Services: Deliver regionalized services to multiple counties, with each county retaining governance authority. In a county with a population less than 100,000, single county LPHAs may be governed by either the Board of County Commissioners or a separate Board of Health with at least three members appointed by the Board of County Commissioners.

District LPHAs: Deliver regionalized services to multiple counties as one. District LPHAs are governed by a district board of health with at least five members appointed by an appointments committee composed of one member of each of the Boards of County Commissioners of the counties served by the district. Each participating county should have at least one representative on the District Board of Health.
to carry out the public health laws and rules of the State Board, Water Quality Commission, Air Quality Control Commission, and Solid and Hazardous Waste Commission per the statewide public health improvement plan (PHIP)

- Complete a community health assessment (CHA) community health improvement plan (CHIP) at least every five years
- Advise the local board of health on public policy issues necessary to protect public health and the environment
- Provide or arrange for the provision of CPHS
- Administer and enforce laws pertaining to public health, water quality, air pollution, and solid and hazardous waste; vital statistics; and the orders, rules, and standards of the state board
- Investigate and control the causes of epidemic or communicable disease and conditions affecting public health
- Establish, maintain, and enforce isolation and quarantine
- Close schools and public places and prohibit gatherings of people when necessary to protect public health
- Investigate and abate nuisances to eliminate sources of epidemic or communicable disease and conditions affecting public health
- Establish, maintain, or make available chemical, bacteriological, and biological laboratories, and conduct laboratory investigations and examinations as necessary
- Purchase and distribute approved biological or therapeutic products necessary for the protection of public health, to licensed physicians and veterinarians, with or without charge, based on emergency or need
- Initiate or carry out health programs consistent with state law that are necessary or desirable by the county or district board to protect public health and environment
- Collect, compile, and tabulate reports of marriages, dissolutions of marriage, and declarations of invalidity of marriage, births, deaths, and morbidity, and to require any person with such information to submit it as required by law
- Make necessary sanitations and health investigations and inspection, on its own or in coordination with CDPHE
- Collaborate with CDPHE and the State Board on all matters pertaining to public health; with the Water Quality Control Commission on all matters pertaining to water quality control; with the Air Quality Control Commission on all matters pertaining to air quality control; and with the Solid and Hazardous Waste Commission on all matters pertaining to solid and hazardous waste
- Establish or arrange for the establishment of, a local or regional child fatality prevention review team

Of note, the county clerk is statutorily obligated to record vital statistics related to marriages (C.R.S. 25-2-106), civil unions (C.R.S. 25-2-106.5), and burials (C.R.S. 25-2-111(7)(a)). This is somewhat in conflict with the provision that LPHAs’ duties include the collection of reports of marriages, dissolutions of marriage, and declarations of invalidity of marriage. These competing roles should be clarified to ensure that governmental public health’s current and full implementation costs related to vital statistics are accurate.

LPHAs activities are subject to appropriations. Specifically, if local boards of health do not receive sufficient appropriations to fulfill all LPHA duties, the local board of health will set priorities for fulfilling those duties and publish those priorities as part of its CHIP26.

While governmental public health in Colorado is decentralized, and counties retain local control of some public health services, the state, through CDPHE, has authority to preempt that local control, if needed.

That is, if a LPHA is ever unable or unwilling to efficiently abate a nuisance or prevent the introduction or spread of a contagious or infectious disease, the local board of health must notify CDPHE to request assistance. In some cases, CDPHE may, on its own, determine that the LPHA is unwilling or unable to act.

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That is, if a LPHA is ever unable or unwilling to efficiently abate a nuisance or prevent the introduction or spread of a contagious or infectious disease, the local board of health must notify CDPHE to request assistance. In some cases, CDPHE may, on its own, determine that the LPHA is unwilling or unable to act.
When this occurs, CDPHE has full authority to ensure the abatement of the nuisance or prevent the introduction or spread of disease. For this purpose, CDPHE may assume the LPHA’s powers and may reallocate state monies from the LPHA to another entity to deliver services in the LPHA’s jurisdiction.

**LPHA Public Health Fund**

LPHAs are statutorily obligated to maintain a public health agency fund to manage agency resources, including:

- Any monies appropriated from a county general fund
- Any monies received from state or local appropriations, or any other gifts, grants, donations, or fees for local public health purposes

It is intended that fund resources be expended only for public health purposes and any payables or other claims against the fund be certified by the public health director and local board of health.

Public health funds are managed by county treasurers (an elected position in Colorado counties) as part of their official duties.

For District LPHAs, the county treasurer of the largest member county of the district service as agency and public health fund treasurer, unless the district LPHA serves a population less than 4,000. In that case the counties may collectively decide which county’s treasurer will preside over the public health fund.

**Budgeting**

On or before September 1st of each year, LPHAs must develop an agency budget that estimates the total cost of maintaining the LPHA for the following fiscal year, as well as any potential unexpended surpluses from state or federal funds or other grants or donations. This budget must be approved by the local board of health who are responsible for providing any monies necessary beyond what is estimated by the local board of health to be available, from county general funds (although local boards of health may revise the budget to eliminate the additional funding need).

In the case of district LPHAs, the local board of health is responsible for apportioning the estimated outstanding revenue need to the counties participating in the district proportionally based on population, using the most recent federal census.

Counties are then obligated to provide the requested funds from county general funds.

**Local Boards of Health**

As described in detail in Exhibit 20, LPHAs are governed by local Boards of Health. In single county LPHAs where the county population is less than 100,000, the Board of County Commissioners may act as the Board of Health. Multi-county LPHAs are governed by a District Board of Health, whose members are appointed by a committee comprised of members representing the member counties.

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27 C.R.S. 25-1-511
28 C.R.S. 25-1-511

**Exhibit 21. Colorado LPHAs by Governance Type (Board of Health vs. Board of County Commissioners), 2018**

![Map of Colorado LPHAs by Governance Type](source)
Exhibit 21 shows where governance is provided by a separate Board of Health or the Board of County Commissioners acting as the local board of health.

Of the 42 LPHAs eligible to be governed by their Board of County Commissioners, 26 (over 60%) elect to do so. Local Boards of Health (including Boards of County Commissioners acting as local boards of health) powers and duties include:

- To develop and promote public health policies needed to secure the conditions necessary for a healthy community
- Approve community health improvement plans
- Appoint LPHA public health director
- Provide, equip, and maintain facilities for delivering CPHS
- Determine general policies to be followed in administering and enforcing public health laws, orders, and rules locally, as well as State Board orders, rules, and standards
- Maintain consistency with state public health laws and orders, rules, and standards
- Act in advisory capacity to public health director
- Hold hearings, administer oaths, subpoena witnesses, and take testimony in all matters related to local board of health performance
- Provide environmental health services and assess fees to offset the actual, direct cost of those services (except where fees are already levied by the state)
- To accept, use, disburse, and administer all federal and state revenues, and other property, services, or monies allocated to the LPHA
- To approve, if desired, a local clean syringe exchange program

Like in the case of LPHAs, these powers and duties are clearly and succinctly articulated in statute.29

It is notable that LPHA public health directors serve “at the pleasure of the county or district board”, which can have the effect of politicizing governmental public health staffing. This feature of the local governmental public health system has been cited as a factor that can increase turnover in these leadership positions, which can have an impact on the quality, consistency and continuity of local public services.

Local Boards of Health, including Boards of County Commissioners acting as local boards of health, are statutorily obligated to hold regular meetings at least once every three months, although special meetings can be called, including by the LPHA public health director.

The primary differences between local public health agencies governed by a separate Board of health and those governed by their Board of County Commissioners are the board membership and the overall scope of

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29 C.R.S 25-1-508(3)
responsibility.

- **Scope of responsibility.** Local Boards of Health are solely focused on matters of public health importance, while Boards of County Commissioners must be concerned with the holistic management of all services provided by county government.

- **Membership.** Boards of County Commissioners comprise three elected members, who may come to the position with no particular experience or expertise related to public health.

  Boards of Health may be larger than three members, allowing for greater diversity of interests to be represented including members with public health experience and expertise.

  Since members are appointed by the Board of County Commissioners, these separate Boards of Health often include County Commissioners who choose serve in both capacities.

Although the powers and duties of local Boards of Health and Boards of County commissioners acting as local boards of Health do not differ, there is a perception within the governmental public health system that separate Boards of Health are more effective responsive to the public health needs of their communities.

Common reasons cited for this perception are that separate Boards of Health are more likely to have members with public health experience and/or expertise and their scope is limited to public health, it is possible to spend more time and have a greater focus on how best to prioritize and deliver the services that the community needs and/or desires.

### Cross Jurisdictional Relationships

Delivery of governmental public health services is organized such that the state agency (CDPHE) delivers a subset of public health services all Coloradans, while LPHAs deliver other services locally, primarily focused within their service areas. While this aligns with the state/local distribution of governance discussed previously, it is in actuality a gross oversimplification as many services are delivered through various cross-jurisdictional relationships where responsibilities are shared. Exhibit 22 graphically depicts how the nature of a particular service may best align with a shared

Exhibit 22. Cross Jurisdictional Delivery Spectrum

![Exhibit 22: Cross Jurisdictional Delivery Spectrum](source: Habile, 2019.)
responsibility approach.

These broader options, which include options between centralized state governance and delivery of services and decentralized local (generally, county-level) governance and delivery of services, are examples of cross-jurisdictional sharing, which is defined as “the deliberate exercise of public authority to enable collaboration across-jurisdictional boundaries to deliver public health services and solve problems that cannot be easily solved by single organizations or jurisdictions.”

This is supported by the fact that there are existing cross jurisdictional relationships throughout Colorado’s governmental public health system that fall within the cross-jurisdictional delivery spectrum shown in Exhibit 22.

It’s worth stating that these existing cross jurisdictional relationships vary in formality. Some of the example cross jurisdictional delivery relationships and models below are highly informal (information sharing, handshake agreements), while some are highly formalized (through memorandums of understanding, intergovernmental agreements, and, even, shared governance bodies).

Locally-governed, Fully Decentralized

Locally-governed, fully decentralized services are one “half” of Colorado’s bifurcated governmental public health governance and service delivery paradigm. The primary model through which governmental public health agencies can deliver locally-governed, fully decentralized services is through the normal operation of single county LPHAs (some of which may be subordinate to county health and human services departments), however, single county LPHAs coordinating with quasi-governmental agencies also provide locally-governed, fully decentralized services. These are both formalized governance and service delivery models, as they are LPHA structures.

- Single County LPHAs. Single county LPHAs, deliver decentralized services to a single county.
- Single County LPHA subordinate to County Health and Human Services Department. Single county LPHAs that operate as a division of broader county health and human services efforts and deliver decentralized services in a single county.
- Single County LPHA Coordinating with a Quasi-governmental Agency. These LPHAs work in cooperation with a quasi-governmental agency to deliver decentralized services to a single county.

The majority of local governmental public health services (LPHA services for 45% of Colorado’s 64 counties) are delivered through one of these models.

Locally-governed, Regionally-delivered Services

One LPHA structure, single county LPHAs with contractual agreements to provide services, allow for locally-governed, regionally delivered services. Again, this governance and service delivery model is formalized as a service delivery structure.

- Single County LPHAs with Contractual Arrangements to Provide Services. These LPHAs deliver regionized services to multiple counties, which each county retaining governance authority. Currently, there are three examples of this structure:
  - Jefferson County Public Health delivers services in Gilpin County, on behalf of Gilpin County Public Health Agency
  - Prowers County Public Health and Environment delivers services in Kiowa County, on behalf of Kiowa County Public Health Agency
  - Otero-Crowley Health Department is a contractual collaboration between Otero and Crowley counties through which services are delivered in both counties

Beyond this structure, many LPHAs have service-related arrangements with other LPHAs:

- Service-specific locally-governed cross
jurisdictional sharing arrangements. LPHAs may enter into service-related arrangements with other LPHAs to either provide or receive services. These service-related arrangements may be very informal (just a handshake agreement) or formalized by a memorandum of understanding or other contractual documentation).

Shared Local-local Governed, Regionally-delivered Services

Some LPHAs have chosen to develop shared programs or functions with other LPHAs. In some cases, this is specific to a particular service, while in other cases, LPHAs may collaborate on a range of issues.

- **Shared Programs or Functions.** LPHAs may develop joint programs and services or joint shared capacity with other LPHAs.

- **Partnerships/Collaborations.** LPHAs may collaborate through another named entity to develop joint programs and services or joint shared capacity with other LPHAs. There are three main example collaborations in Colorado, currently:
  - **Metro Denver Partnership for Health.** This partnership is a collaborative effort among Boulder County Public Health, Broomfield County Department of Health and Human Services, Denver Department of Public Health & Environment, Denver Public Health, Jefferson County Public Health, and Tri-County Health Department.
  - **San Luis Valley Public Health Partnership.** This partnership is a collaborative effort among Alamosa County Public Health Department, Silver Thread Public Health Agency on behalf of Mineral County, Rio Grande Public Health Agency, Costilla County Public Health Agency, Conejos County Public Health and Nursing Service, and Saguache County Public Health Department.
  - **West Central Public Health Partnership.** This Partnership is a collaborative effort among Delta County Health Department, Gunnison County Health and Human Services, Silver Thread Public Health on behalf of Hinsdale County, Montrose County Health and Human Services, Ouray County Public Health Agency, and San Miguel County Public Health.

These partners have a formal Roadmap that guides their collaboration and cross-department workgroups working on behavioral health, climate change and health, data sharing, early childhood, health equity, healthy eating active living (HEAL), and partnership alignment.

- **San Luis Valley Public Health Partnership.** This partnership is a collaborative effort among Alamosa County Public Health Department, Silver Thread Public Health Agency on behalf of Mineral County, Rio Grande Public Health Agency, Costilla County Public Health Agency, Conejos County Public Health and Nursing Service, and Saguache County Public Health Department.

The partnership is currently collaborating on emergency preparedness and response planning and capacity; epidemiology, including investigation of salmonella, rabies, and food-borne illnesses; child fatality reviews and prevention strategies; behavioral health integration work and stigma reduction; tobacco and suicide prevention activities; breastfeeding coalition; and regional environmental health.

The Partnership also completes a regional CHAPS process.

- **Metro Denver Partnership for Health.** This partnership is a collaborative effort among Boulder County Public Health, Broomfield County Department of Health and Human Services, Denver Department of Public Health & Environment, Denver Public Health, Jefferson County Public Health, and Tri-County Health Department.

Implementing these shared programs or functions and administering these collaborations can be difficult as there is limited policy infrastructure to support LPHA collaboration.

Additionally, implementing policies designed to support pooling of funding, cost-sharing and allocation, and shared infrastructure would help advance these cross jurisdictional relationships.

Shared State-local Governed, Decentralized Services

Just like many LPHAs have service-related arrangements with other LPHAs, LPHAs may enter into service-related arrangements with CDPHE and vice versa:

- **Service-specific state-local governed cross jurisdictional sharing arrangements.** LPHAs may enter into service-related
arrangements with CDPHE such that they deliver local services on behalf of CDPHE (for example, local air quality testing) or CDPHE provides local services on behalf of the LPHA (for example, consumer protection activities, like retail food inspections). The degree of formality of these arrangements and whether they include a compensatory element can also vary.

**Regionally-Governed, Regionally-delivered Services**

Some counties have regionalized to deliver regionally-governed and delivered services through district LPHAs:

- **District LPHAs.** Deliver regionalized services to multiple counties as one. District LPHAs include:
  - Las Animas-Huerfano Counties District Health Department serving Las Animas and Huerfano counties.
  - San Juan Basin Public Health serving Archuleta and La Plata counties.
  - Silver Thread Public Health District serving Hinsdale and Mineral counties.
  - Tri-County Health Department serving Adams, Arapahoe, and Douglas counties.

Many emergency preparedness and response services (All Hazards) are regionally-governed and delivered, through the state’s Emergency Management regions (“All Hazards Regions”). These regions were created through Executive Order D013-03, which mandated that all state agencies with responsibilities related to the publics’ safety, including CDPHE, adopt them. These nine All Hazards Regions are shown in Exhibit 23.

**Shared State-local Governed, Mostly Centralized Services**

In Colorado, laboratory services are shared state-local governed and mostly centralized, with four state and regional laboratory providers, including:

- CDPHE State Laboratory
- El Paso County Public Health Regional Laboratory
- Pueblo Department of Public Health and Environment Laboratory
- Weld County Department of Public Health and Environment Regional Laboratory

**State-governed, Fully Centralized**

State-governed, fully centralized services are the other “half” of Colorado’s bifurcated governmental public health governance and service delivery paradigm. These services are delivered centrally by CDPHE.

**Existing/Natural Governmental Public Health System Cross Jurisdictional Delivery Partners**

Although governance and delivery of governmental public health services is generally split, between CDPHE providing some services statewide while LPHAs deliver other services locally, there already exist numerous instances where services are delivered through various forms of cross-jurisdictional partnerships. It is expected that cross jurisdictional delivery will continue to increase as governmental public health agencies continue to be resource constrained and as benefits of collaboration are realized.

**Existing/Natural LPHA Cross Jurisdictional Delivery Partners**

Some of the current cross-jurisdictional partnerships were facilitated through two existing “regional structures” that were developed to address specific issues: (1) Colorado’s All Hazards Regions (shown in Exhibit 23); and, (2) Colorado’s Health Statistics Regions (shown in Exhibit 23).

Colorado’s All Hazards Regions were implemented in 2003 as part of an Executive
Order (D013 03) which organized Colorado’s counties into nine regions.

Since the governmental agencies within region, including LPHAs, are expected to collaborate on emergency management and response, it makes sense that they would collaborate on the foundational capability, Emergency Preparedness and Response. This collaboration may also lead them to collaborate in other areas.

Colorado’s health statistics regions were developed by CDPHE’s Health Statistics Section to support regional analysis, particularly when county level data does not have adequate sample size or a sufficient number of events to support reliable estimation. The 21 Health Statistics Regions were developed by grouping LPHAs with similar demographic characteristics and service patterns, and with the input of local communities.

Although, the Health Statistics Regions are not examples of sharing relationships, they do provide insight into potential natural sharing partners, as there are many CPHS functions, elements, and activities related to data. It may make sense for those in the same Health Statistics Regions to collaborate on those activities, especially where their own community-level data is suppressed.

Existing sharing partners within Colorado’s governmental public health system are documented and summarized in Exhibit 25.
Exhibit 25 is organized with the counties in the center of the state moving outward, clockwise. This allows for geographic clustering that shows clusters of existing and natural sharing partners.

It’s important to note that this analysis was done exclusively based on the primary dataset, which is point in time data, and secondary information about All Hazards and Health Statistics Regions; as such, it may not document every existing relationship between and among LPHAs and should continue to be advanced as the cross jurisdictional delivery changes.

Because some LPHAs may touch many other LPHAs, this visual is imperfect. However, all of the data is included such that individual LPHAs could create a matrix of their own partners, potential partners, and geographic relationships to support their own work.

Source: Habile, 2019.
Weld
Otero-Crowley
Kiowa
Prowers
Baca
Las Animas-Huerfano
Pueblo
Custer
Fremont
Costilla
Alamosa
Conejos
Rio Grande
Saguache
San Juan Basin
San Juan
Montezuma
Delores
Silver Thread - Mineral
Silver Thread - Hinsdale
Gunnison
Oxaré
San Miguel
Montrose
Delta
Rio Blanco
Routt
Garfield
Eagle
Summit
Grand
Mesa

LEGEND
- Members of Same All Hazards Region
- Data Aggregated in Same Health Statistics Region
- Both Members of Same All Hazards Region and Data Aggregated in Same Health Statistics Region
- Single County LPHAs with Contractual Arrangements to Provide Services
- Existing Cross Jurisdictional Delivery Arrangements
Existing/Natural CDPHE and LPHA Cross Jurisdictional Delivery Relationships

The graphic in Exhibit 25 is limited to showing cross jurisdictional relationships among LPHAs and so it does not consider the potential opportunities for LPHA-CDPHE partnerships even though there are many such.

The challenge in reporting on this type of sharing using the Assessment dataset, is that the CPHS operational definitions are agnostic to which governmental public health provider provides the service.

In some cases, the definitions might include a function, element, or activity where CDPHE and locals may each have a role. In these cases, each agency fulfilling their respective roles is not considered “sharing.” Rather, these are examples where CDPHE and LPHAs have complementary roles in delivery a core service which creates service interdependencies.

For example, in the realm of communicable disease prevention, CDPHE may provide a statewide immunization information system and LPHAs may train local providers to use the system, thus creating a service interdependency, but would not constitute a shared service delivery relationship.

Existing Cross Jurisdictional Delivery Relationships with Non-governmental Public Health Agencies

Because CPHS are defined as a subset of all public health services which meet key criteria, including that they are services where the governmental public health system is the only or primary provider of the service, statewide, we believe that, largely, sharing should only be occurring between governmental public health providers.

However, CPHS as they are currently defined...
represent a new service paradigm, as such, there are many examples of governmental public health agencies sharing with other governmental, quasi-governmental, community-based, nonprofit, and even for-profit organizations, including but not limited to:

- Federal agencies (CDC, EPA, FDA, USDA, USGS, etc.)
- Other state agencies
- Health Districts
- Counties
- Cities
- School Districts
- Mosquito Control Districts
- Public Utilities Districts
- Emergency Management Agencies
- Hospitals and private healthcare providers
- Landfills
- Academic institutions
- Foundations and nonprofits

As implementation of CPHS proceeds, it will be important to clarify the appropriate roles of these non-governmental public health providers, including broader state and county government, as has been discussed previously.

This does not necessarily mean excluding these partners, as cross sector partnerships and collaboration are important to the success of public health system transformation. However, it may mean transitioning the work that they do in service to the governmental public health system to a contracting relationship to maintain governance control over the activities.
Current Implementation and Spending on Core Public Health Services

Current Implementation of CPHS

Understanding the current implementation and spending on CPHS is a critical building block to understanding what may be required to achieve full implementation.

While the assessment collected and analyzed detailed information on level of implementation at the element- and activity-level for all agencies, the primary objective of this work is to inform to assess the overall statewide situation in order to support public health system transformation.

As a result, analysis of current level of implementation is segmented and presented in different sections of this report. As shown in Exhibit 26, this section of the report focuses on the statewide analysis which is limited to the more aggregate levels of the CPHS definitions.

Composite scores for each agency and for CPHS overall are not particularly meaningful in terms of communicating agency- or system-level needs for full implementation (that is, they are at such an altitude that they no longer illustrate where the gaps are for the agency or system) they do allow for more simple comparisons, such as comparing the current degree of implementation to full implementation (i.e., how close to full implementation are we?). They may also provide useful agency- and system-level metrics for long term tracking of implementation (i.e., how much progress are we making in implementing CPHS over time?).

More detailed comparisons of the degree of implementation and population by level of service for foundational capabilities and services, and functions, (including cross tabulated by size and governance, population, and rate of population living in poverty) and the level of implementation and population level of service for elements and activities are available in the Detailed Report.

It’s important to acknowledge the limitations of this analysis. First, it is based on self-reported estimates of current implementation of a newly defined version of CPHS.

These LPHAs were asked to self-assess the capacity and expertise with which the elements and activities they govern are delivered in their communities. This was challenging for LPHAs where there may be other service providers supporting the implementation of a particular service in...
the community\(^1\).

Second, the analysis is not evaluative, it merely communicate the level and degree to which CPHS can be implemented, and the level at which the population is being served, within existing resources.

Third, the analysis doesn’t make any effort to understand what capacity and expertise (through the lens of level and degree of implementation and level of service to the population) “buys” in terms of work being completed or access to services being provided to residents.

Anything below full implementation could refer to not all pieces of the work being implemented, the work not being implemented on behalf of everyone, or any combination of the two.

The checkerboard on the following two pages (Exhibit 28) shows the current degree of implementation of CPHS functions by governmental public health agency, with each row representing one CPHS function and each column representing one agency.

Agencies are organized smallest to largest, with the smallest on the agency on the left and largest on the right. This allows for visualization of any patterns based on the population served. A single statewide composite score to show the degree to which particular services are implemented systemwide.

This composite score is a weighted average of governmental public health agency scores, so it does not represent a systemwide mean or median score to which you could compare individual agency implementation to.

The checkerboard shows that there are no CPHS functions that are implemented universally across the entire governmental public health system. Instead, there are varied gaps throughout the entire system, which vary depending on the individual governmental public health agency.

The checkerboard does seem to indicate that, overall, there are more areas where extra small LPHAs have significant gaps in implementation, however this does not mean that those agencies CPHS work is less implemented overall, as these areas likely represent smaller shares of their work.

Later in this report (Exhibit 32), there is a map showing composite scores by agency for CPHS overall, which can speak to whether extra small LPHAs (or any other size band) have disproportionate gaps in implementation, relative to other size bands.

that there are a few specific functions that have a higher concentration of services which are minimally or limited in their implementation. Those that appear to be least implemented overall include:

- A.7. Health Equity and Social Determinants of Health; and,
- B.2. Environmental Public Health, particularly function B.2.e. Land Use Planning and Climate Change.

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\(^1\) Specifically, San Juan County has indicated that their self-assessment may be more informed by their own capacity and expertise as an agency, than by the total capacity and expertise available in their community. JeffCo has indicated that this may be true for B.2. Environmental Public Health in their community.
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<th>Source: Habile, 2019.</th>
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| El Paso      | Mesa      | Broomfield | Eagle  | Fremont | Montezuma | Teller | Otero-Crowley | Pitkin  | CDPHE | TCHD | DDHPE | El Paso | Jefferson | Larimer | Boulder | Weld | Pueblo | Mesa | NCDO | San Juan Basin | Broomfield | Garfield | Eagle | Fremont | Montrose | Summit | Delta | Elbert | Montezuma | Routt | Teller | Otero-Crowley | Las Animas-Huerfano | Chaffee | Park | Pitkin |
|-------------|-----------|------------|--------|---------|-----------|--------|--------------|--------|------|-------|-------|-------|---------|---------|----------|--------|-------|-------|-------|--------|-------|--------|--------|-------|--------|--------|--------|--------|-------|-------|--------|--------|-------|--------|-------|
The Foundational Capability and Service checkerboard is really no different - showing that there are no CPHS functions that are implemented universally across the entire governmental public health system. Instead, there are varied gaps throughout the entire system, which vary depending on the individual governmental public health agency. Again, the checkerboard does seem to indicate that, overall, there are more areas where extra small LPHAs have significant gaps in implementation, in this case, it does seem to appear that some of these LPHAs are less implemented overall.

The foundational capability- and service- level checkerboard also seems to confirm that the foundational capabilities and programs A.3. Policy Development and Support, A.7. Health Equity and Social Determinants of Health, and B.2. Environmental Public Health, and have a higher concentration of governmental public health agencies that are minimally or limitedly implemented.

### Exhibit 29. Current Degree of Implementation of CPHS Foundational Capabilities and Services by Governmental Public Health Agency, including Systemwide Composite Score, 2018

| Degree of Implementation | CDPHE | TCHD | DDPHE | El Paso | Jefferson | Larimer | Boulder | Weld | Pueblo | Mesa | NCHD | San Juan Basin | Broomfield | Garfield | Eagle | Fremont | Montrose | Summit | Delta | Elbert | Montezuma | Routt | Teller | Otero-Crowley | Las Animas-Huerfano | Chaffee | Park | Prow |
|--------------------------|-------|------|-------|---------|-----------|---------|--------|------|--------|------|------|----------------|------------|--------|-------|---------|-----------|-------|------|--------|----------|-------|------|---------|----------------|--------|-------|
| 2                        | 8.3   | 10   | 7.5   | 9.6     | 9.0       | 5.9     | 9.2    | 9.2  | 6.7    | 9.4  | 6.5  | 7.7            | 7.0        | 7.8    | 7.8   | 8.6     | 6.7        | 6.0   | 3.6  | 3.9    | 2.2       | 4.5   | 4.7  | 6.4     | 8.9         | 7.1    | 6.3   | 7.8    |
| 4                        | 6.9   | 7.3  | 7.7   | 7.9     | 7.8       | 5.8     | 7.5    | 7.8  | 7.8    | 9.1  | 10   | 7.0            | 5.6        | 9.0    | 6.2   | 4.9     | 8.3        | 7.0   | 6.6  | 4.9    | 4.6       | 5.9   | 6.8  | 6.6     | 9.2         | 7.9    | 5.7   |
| 6                        | 6.9   | 8.0  | 5.9   | 4.6     | 5.6       | 5.0     | 7.1    | 9.1  | 5.5    | 9.5  | 8.8  | 6.6            | 6.6        | 7.8    | 8.9   | 5.7     | 8.0        | 5.8   | 7.1  | 5.5    | 2.0       | 3.1   | 4.8  | 6.3     | 6.5         | 7.3    | 6.1   | 6.8    |
| 8                        | 6.3   | 8.5  | 4.5   | 8.0     | 7.8       | 5.3     | 6.9    | 8.8  | 7.2    | 10   | 10   | 8.0            | 7.4        | 7.0    | 10    | 7.9     | 10         | 7.3   | 6.1  | 7.0    | 2.9       | 8.0   | 8.1  | 8.0     | 9.4         | 9.4    | 7.4   |
| 10                       | 7.8   | 7.6  | 7.4   | 4.4     | 7.9       | 6.7     | 6.8    | 8.9  | 6.9    | 9.8  | 8.1  | 7.6            | 6.7        | 7.2    | 8.7   | 9.9     | 6.9        | 6.2   | 6.0  | 7.6    | 6.8       | 6.8   | 8.2  | 9.3     | 6.3         | 5.9   |
| A.6                       | 7.1   | 8.7  | 6.4   | 6.6     | 8.2       | 5.3     | 8.9    | 8.2  | 6.5    | 9.8  | 8.0  | 8.0            | 7.8        | 8.8    | 7.2   | 8.2     | 6.9        | 7.3   | 5.6  | 6.2    | 7.0       | 7.8   | 7.8  | 9.2     | 7.8         | 5.4   |
| A.7                       | 6.3   | 6.4  | 4.6   | 6.9     | 4.0       | 5.5     | 7.6    | 7.2  | 6.6    | 9.8  | 7.5  | 6.8            | 4.9        | 6.8    | 7.9   | 3.9     | 10         | 5.8   | 4.3  | 6.0    | 3.3       | 5.3   | 5.9  | 3.0     | 4.0         | 9.1    | 6.3   | 6.0    |
| B.1                       | 8.4   | 8.4  | 7.6   | 8.0     | 8.6       | 6.5     | 9.0    | 7.6  | 8.2    | 10   | 7.2  | 5.8            | 7.9        | 8.9    | 9.8   | 7.7     | 9.8        | 8.0   | 8.3  | 7.0    | 2.8       | 7.1   | 8.7  | 7.0     | 10         | 9.8    | 9.3   | 6.8    |
| B.2                       | 7.9   | 7.8  | 6.8   | 8.3     | 3.6       | 4.3     | 7.2    | 8.6  | 6.0    | 9.6  | 8.3  | 6.8            | 5.7        | 6.9    | 6.4   | 5.6     | 8.3        | 5.6   | 7.9  | 5.5    | 6.6       | 7.0   | 7.4  | 7.7     | 6.6         | 7.6    | 3.8   | 5.9    |
| B.3                       | 6.2   | 6.5  | 4.2   | 7.4     | 8.1       | 5.7     | 8.1    | 8.6  | 6.2    | 10   | 8.8  | 7.1            | 6.2        | 7.6    | 7.4   | 3.4     | 10         | 7.1   | 4.8  | 4.0    | 3.6       | 5.3   | 7.1  | 6.9     | 9.8         | 10     | 7.8   | 3.7    |
| B.4                       | 7.6   | 7.9  | 6.8   | 4.4     | 8.3       | 5.3     | 7.4    | 7.9  | 6.2    | 10   | 8.0  | 6.3            | 6.6        | 8.4    | 9.8   | 6.0     | 4.9        | 6.3   | 8.0  | 3.0    | 2.3       | 4.4   | 5.6  | 6.0     | 10         | 9.4    | 6.6   | 5.1    |
| B.5                       | 5.7   | 6.4  | 7.5   | 4.3     | 7.9       | 5.8     | 6.9    | 8.0  | 6.0    | 10   | 8.0  | 8.0            | 7.2        | 9.5    | 9.8   | 6.3     | 10         | 6.6   | 6.1  | 5.7    | 4.0       | 7.0   | 7.2  | 7.0     | 7.8         | 10     | 9.8   | 5.4    |

Source: Habile, 2019.
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</table>
Exhibit 30 through Exhibit 32 provide chloropleth maps showing the degree of implementation for foundational capabilities, and services, and CPHS overall. The maps don’t illustrate any glaring geographic patterns in implementation.

As shown in Exhibit 30, foundational capabilities overall are approximately 64% implemented with an overall score of 7.1.

Similarly, as shown in Exhibit 31, foundational services overall are approximately 88% implemented with an overall score of 7.

Exhibit 31. Systemwide Degree of Implementation for Foundational Services Overall, 2018

Overall, as shown in Exhibit 32, CPHS services are approximately 86% implemented with an overall score of 6.9.

Exhibit 32. Systemwide Degree of Implementation for CPHS Overall, 2018

However, based on earlier evidence that seemed to indicate that overall, there were more areas where extra small LPHAs had significant gaps in implementation, we created Exhibit 33, which shows the distribution of CPHS composite degree of implementation scores plotted against LPHAs by population. What this shows is that there are more extra small LPHAs with lower degrees of implementation, but that this is likely a function of there just being more extra small LPHAs in general, rather than directly correlated to LPHA size (based on population served).

Exhibit 33. Systemwide Distribution of CPHS Composite Degree of Implementation Scores by Population, 2018

While understanding degree of implementation at a governmental public health agency-level is for individual agencies as they consider implementation, it is also necessary to think systemically. To support this, we have generated a systemwide composite score for implementation of CPHS overall. We find that, overall, Colorado’s governmental public health system has achieved a basic level of implementation, with CPHS overall approximately 61% implemented.

While this composite score is not particularly meaningful in terms of communicating agency- or system-level needs for full implementation (that is, it is at such an altitude that it no longer illustrates where the gaps are for the agency or system) it may be useful to (1) compare the current degree of implementation to full implementation (i.e., how close to full implementation are we?) and (2) as agency- and system-level metrics for long term tracking of implementation (i.e., how much progress are we making in implementing CPHS over time?).

Exhibit 34 illustrates the overall implementation of the CPHS framework for Colorado’s governmental public health system overall. This sunburst graphic is useful illustration of that level of implementation as it provides detail into the varied implementation of the framework components and allows for comparison between individual agency implementation (as presented in the agency-level profiles and their respective sunbursts in the Detailed Results). This graphic may also be a useful tool for communicating implementation, including longitudinally.

Exhibit 34. Current Degree of Implementation of CPHS for Colorado Systemwide, 2018
Current Spending on CPHS

The primary dataset was used to analyze the governmental public health system’s current spending in FY2018 on Foundational Capabilities and Services, drilled down to the function level. As a reminder, these are the subset of public health services “needed everywhere to work anywhere,” so this analysis only represents part of the governmental public health system’s spending in FY 2018.

The total estimated spending on CPHS can be interpreted as the level of spending required to achieve the implementation levels achieved in 2018 and shown in previous exhibits. This should not be confused with the amount of revenue needed to achieve this level of implementation.

The inflexibility, unpredictability, and insecurity of governmental public health revenues in Colorado is such that the amount of revenue needed to achieve this spending amount is often greater than the spending amount itself.

For example, some categorical funding streams may include non-CPHS activities, but a share of those revenues (including potential match) may be critical to funding CPHS activities.

We did not specifically identify the funding sources funding this current spending, however, section Introduction, Understanding Existing Governmental Public Health Funding and Financing of this Overall Report provides a high-level summary of current funding.

As Exhibit 35 and Exhibit 36 show, the governmental public health system spent just over $278 million on CPHS in (S)FY 2018 (approximately $48.90 per capita). This does not include pass through spending from CDPHE to LPHAs - it attempts to count only the dollars spent “on the ground” for CPHS. A little less than 39% of this “on the ground” spending was done by CDPHE, while approximately 61% was done by LPHAs.

The CDPHE and LPHA columns of these exhibits show, respectively, the distribution of CDPHE and LPHAs’ current spending on CPHS functions. There is significant variation between CDPHE and LPHAs spending. Because CDPHE spending was 39% of total spending in (S)FY 2018, we have only highlighted instances where CDPHE’s share of spending was greater than 50% including:

- CDPHE spent significantly more on function A.1.e Public Health Laboratory Services than LPHAs. This is unsurprising because CDPHE operates the primary state or regional lab, and only three LPHAs operate a regional lab.
- CDPHE was the only agency that spent money on functions B.3.e. Mandated Newborn Screening and B.4.c. Health Facility Inspection and Licensure. Again, this is unsurprising, because these are “state roles only”, which means that CDPHE should be the only governmental public health agency providing the service.
- CDPHE represented 54% of the spending on A.1.b. Data Access, Analysis, and Interpretation and A.5.e. Information Technology/Informatics (IT).

This is likely because of the cost generating and distributing statewide data and of operating statewide information and surveillance systems that LPHAs also use and benefit from.

Similarly, we think this statewide surveillance and data work is why CDPHE was a disproportionate share of spending on B.1.a Communicable Disease Prevention, which is heavily focused on providing data and conducting surveillance.

- CDPHE also reported spending more on B.4.d. Linkage to Clinical Care than LPHAs. This was extremely surprising, as ostensibly, LPHAs are more likely to see patients in a clinical care setting than CDPHE.

However, digging deeper into the definitions, you can see that two of the activities under this function are related to systems work (B.4.d.i.i. Identify, implement, and promote strategies that improve access to health care services and B.4.d.i.ii. Coordinate efforts with governmental and community partners to link individual to health services), rather
than linkage of patients to providers. Because LPHAs spent more than CDPHE, in general, in (S)FY, it is unsurprising that they spent more than CDPHE in many functions. Instead, what is interesting, are areas where LPHAs share of spending is significantly than their overall share of spending.

- We found that LPHAs represented greater than 75% of sharing for 25 functions, including:
  - A.2.b. Public Communications
  - A.3.a. Policy Development
  - A.3.b. Policy Enactment
  - A.3.c. Policy Evaluation
  - A.4.a. Partner and Community Relationships
  - A.5.c. Legal Services and Analysis
  - A.6.b. Emergency Support Function 8
  - A.7.a. Leadership and Workforce Training and Diversity
  - A.7.b. Health Equity Policy
  - A.7.c. Health Equity Data
  - B.1.c. Communicable Disease Investigation and Control
  - B.1.e. Coordination of Other Communicable Disease Services with Foundational Capabilities
  - B.2.d. Zoonotic Conditions
  - B.2.e. Land Use Planning and Climate Change
  - B.2.f. Coordination of Other Environmental Health Services with Foundational Capabilities
  - B.3.a. Maternal, Child, Adolescent and Family Health Information
  - B.3.b. Identify Maternal, Child, Adolescent and Family Health Assets
  - B.3.c. Collaborative Efforts around Maternal, Child, Adolescent, and Family Health
  - B.4.b. Chronic Disease, Injury Prevention and Behavioral Health Promotion Assets
  - B.4.c. Chronic Disease, Injury Prevention and Behavioral Health Promotion Policies
  - B.4.d. Coordination of Other Chronic Disease, Injury Prevention, and Behavioral Health

In most cases, these results are because these functions largely represent services delivered at the community-level.

- It was notable that CDPHE (Colorado’s environmental health organization) is spending very little on B.2.e Land Use Planning and Climate Change. However, this seems to be primarily because Land Use Planning is a locally-aligned activity in Colorado, to the extent that a different state agency, focused on local affairs (Colorado Bureau of Local Affairs) is responsible for statewide activities related to land use planning and climate change. Because B.2.e Land Use Planning and Climate Change is part of the CPHS framework and therefore intended to be the role of governmental public health, this presents a philosophical challenge in bounding the role of governmental public health, similar to the case of county clerks delivering vital records in some counties under statutory direction.

Approximately, 47% of Colorado’s governmental public health system’s (S)FY 2018 current spending (51% pf CDPHE spending and 45% of LPHA spending) funded foundational capabilities and 53% (49% of CDPHE spending and 55% of LPHA spending) funded foundational services.

The distribution of total spending is further illustrated by the bars showing the relative spending by function, colored by type of service. The distribution of this current spending is explored further in Exhibit 377.
Exhibit 35. Current Spending by Function, Foundational Capabilities, (S)FY 2018

<table>
<thead>
<tr>
<th>A. Foundational Capabilities</th>
<th>CDPHE</th>
<th>LPHAs</th>
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<td>6. Emergency Preparedness and Response:</td>
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<td>e. Health Equity Communications</td>
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<th>Share of CPHS Grand Total</th>
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<th>47%</th>
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<td>CPHS GRAND TOTAL</td>
<td>$107,253,000</td>
<td>$170,978,000</td>
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Source: Habile, 2019.
### Exhibit 36. Current Spending by Function, Foundational Services, (S)FY 2018

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<th>B. Foundational Services</th>
<th>CDPHE</th>
<th>LPHAs</th>
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<td>1. Communicable Disease Prevention, Investigation and Control:</td>
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<tr>
<td>a. Communicable Disease Prevention</td>
<td>$8,499,000</td>
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<td>b. Identify Communicable Disease Prevention, Investigation and Control</td>
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<td>c. Communicable Disease Investigation and Control</td>
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<td>$5,870,000</td>
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<tr>
<td>d. Immunization</td>
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<td>$8,158,000</td>
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<tr>
<td>e. Coordination of Other Communicable Disease Services with Foundational Services</td>
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<td>$1,576,000</td>
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<tr>
<td>2. Environmental Public Health:</td>
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<td>d. Zoonotic Conditions</td>
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<td>f. Coordination of Other Environmental Health Services with Foundational Services</td>
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<td>3. Maternal, Child, Adolescent, and Family Health:</td>
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<td>b. Identify Maternal, Child, Adolescent, and Family Health Assets</td>
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<td>c. Collaborative Efforts around Maternal, Child, Adolescent, and Family Health</td>
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<td>d. Maternal, Child, Adolescent and Family Health Improvement</td>
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<td>e. Mandated Newborn Screening (State Role Only)</td>
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<td>$1,089,000</td>
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<td>f. Coordination of Other Maternal, Child, Adolescent and Family Health Services with Foundational Capabilities and Services</td>
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</tr>
<tr>
<td>4. Chronic Disease, Injury Prevention, and Behavioral Health Promotion</td>
<td>$4,080,000</td>
<td>$14,855,000</td>
<td>$18,935,000</td>
</tr>
<tr>
<td>a. Chronic Disease, Injury Prevention, and Behavioral Health Promotion D</td>
<td>$1,129,000</td>
<td>$3,295,000</td>
<td>$4,424,000</td>
</tr>
<tr>
<td>b. Chronic Disease, Injury Prevention and Behavioral Health Promotion As</td>
<td>$1,060,000</td>
<td>$3,530,000</td>
<td>$4,590,000</td>
</tr>
<tr>
<td>c. Chronic Disease, Injury Prevention and Behavioral Health Promotion P</td>
<td>$1,057,000</td>
<td>$4,165,000</td>
<td>$5,222,000</td>
</tr>
<tr>
<td>d. Coordination of Other Chronic Disease, Injury Prevention, and Behavior Promotion Services with Foundational Capabilities and Services</td>
<td>$834,000</td>
<td>$3,865,000</td>
<td>$4,699,000</td>
</tr>
<tr>
<td>5. Access to and Linkage with Health Care:</td>
<td>$12,583,000</td>
<td>$6,444,000</td>
<td>$19,027,000</td>
</tr>
<tr>
<td>a. Collaborative Efforts Around Access to Clinical Care</td>
<td>$1,233,000</td>
<td>$2,029,000</td>
<td>$3,262,000</td>
</tr>
<tr>
<td>b. Access to Clinical Care Data</td>
<td>$655,000</td>
<td>$1,272,000</td>
<td>$1,927,000</td>
</tr>
<tr>
<td>c. Health Facility Inspection and Licensure (State Role Only)</td>
<td>$2,167,000</td>
<td>*</td>
<td>$2,167,000</td>
</tr>
<tr>
<td>d. Linkage to Clinical Care</td>
<td>$8,528,000</td>
<td>$3,143,000</td>
<td>$11,671,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Share of CPHS Grand Total</th>
<th>49%</th>
<th>55%</th>
<th>53%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPHS GRAND TOTAL</td>
<td>$107,253,000</td>
<td>$170,978,000</td>
<td>$278,231,000</td>
</tr>
</tbody>
</table>

Source: Habile, 2019.
Exhibit 37 shows the distribution of current spending for CDPHE and LPHA across the Foundational Capabilities and Services, and drilled down to the function level.

Current foundational capability spending falls heavily into two out of seven foundational capabilities: Assessment and Planning and Organizational Competencies. It is unsurprising that Assessment and Planning is a significant share of governmental public health system activities, because that foundational capability supports data collection and distribution, analysis, and CHAPs which is the crosscutting infrastructure that supports all of governmental public health’s data and surveillance work - which is significant as evidenced by the fact that there is at least one data or information related function in each foundational service.

Over 20% of current governmental public health system spending on CPHS supports Organizational Competencies. 40 percent of this spending supports Financial Management, Contract and Procurement Services, and Facilities Management, making it over 8.5 percent of total current CPHS spending.

This is not totally surprising as this function combines several high-value activities and in light of LPHAs comments around the expenses related to competing for much of their funding and meeting reporting and other requirements once they have that categorical funding. Many of the functions, elements

Exhibit 37. Distribution of Current Spending for CDPHE and LPHAs by Foundational Capability and Service and Function, (S)FY 2018

A. FOUNDATIONAL CAPABILITIES
1. Assessment and Planning
   - CDPHE: 12%
   - LPHA: 3%
2. Communications
   - CDPHE: 1%
   - LPHA: 1%
3. Policy Development and Support
   - CDPHE: 1%
   - LPHA: 1%
4. Partnerships
   - CDPHE: 1%
   - LPHA: 1%
5. Organizational Competencies
   - CDPHE: 2%
   - LPHA: 5%
6. Emergency Preparedness and Response
   - CDPHE: 1%
   - LPHA: 1%
7. Health Equity and Social Determinants of Health
   - CDPHE: 1%
   - LPHA: 1%

B. FOUNDATIONAL SERVICES
1. Communicable Disease Prevention, Investigation and Control
   - CDPHE: 2%
   - LPHA: 15%
2. Environmental Public Health
   - CDPHE: 18%
   - LPHA: 1%
3. Maternal, Child, Adolescent and Family Health
   - CDPHE: 1%
   - LPHA: 13%
4. Chronic Disease, Injury Prevention and Behavioral Health Promotion
   - CDPHE: 1%
   - LPHA: 3%
5. Access to and Linkage with Health Care
   - CDPHE: 8%
   - LPHA: 2%

Source: Habile, 2019.
and activities in Organizational Competencies represent overhead. It would be worth evaluating whether current overhead costs are appropriate, and whether categorical funding sources are appropriately compensating agencies for these costs in their “indirect” rates.

Spending across the foundational services is more evenly distributed, with the exception of the foundational service Environmental Public Health, which we’d expect to be larger than the rest, based on the activities it includes.
Needs for Achieving Full Implementation

Implementation Costs and the Additional Spending Needed for Full Implementation

The current implementation analysis shows that the governmental public health system is not able to fully implement CPHS with the resources available today. This implies that additional resources will be needed to achieve full implementation.

When considering the additional increment of resources needed, it important to recall that the current estimate of spending on CPHS may not fully capture the resources needed to provide the estimate of current implementation.

To understand the additional increment of cost related to fully implementing CPHS, a statewide estimate of the full cost of implementing CPHS was developed, using the individual governmental public health agency estimates of the cost of full implementation.

As summarized in Exhibit 38, the estimated annual cost of providing fully implemented CPHS in Colorado would be $445,568,000 (approximately $78.32 per capita), which represents an additional increment of $167,337,000, in current year dollars over current spending. Current spending represents 62% of the full cost of

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Exhibit 38. Current Spending by Function, Foundational Capabilities, 2019

<table>
<thead>
<tr>
<th>Foundational Capabilities</th>
<th>Total Estimated Cost of Full Implementation</th>
<th>Current Spending</th>
<th>Additional Increment of Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment and Planning</td>
<td>$45,324,000</td>
<td>$30,837,000</td>
<td>$14,487,000</td>
</tr>
<tr>
<td>Communications</td>
<td>$14,897,000</td>
<td>$7,368,000</td>
<td>$7,529,000</td>
</tr>
<tr>
<td>Policy Development and Support</td>
<td>$13,346,000</td>
<td>$7,389,000</td>
<td>$5,957,000</td>
</tr>
<tr>
<td>Partnerships</td>
<td>$11,473,000</td>
<td>$8,575,000</td>
<td>$2,898,000</td>
</tr>
<tr>
<td>Organizational Competencies</td>
<td>$76,456,000</td>
<td>$59,323,000</td>
<td>$17,133,000</td>
</tr>
<tr>
<td>Emergency Preparedness and Response</td>
<td>$16,558,000</td>
<td>$9,941,000</td>
<td>$6,617,000</td>
</tr>
<tr>
<td>Health Equity and Social Determinants of Health</td>
<td>$15,088,000</td>
<td>$7,492,000</td>
<td>$7,596,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Foundational Services</th>
<th>Total Estimated Cost of Full Implementation</th>
<th>Current Spending</th>
<th>Additional Increment of Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communicable Disease Prevention, Investigation and Control</td>
<td>$35,031,000</td>
<td>$24,135,000</td>
<td>$10,896,000</td>
</tr>
<tr>
<td>Environmental Public Health</td>
<td>$83,514,000</td>
<td>$57,465,000</td>
<td>$26,149,000</td>
</tr>
<tr>
<td>Maternal, Child, Adolescent and Family Health</td>
<td>$42,467,000</td>
<td>$27,744,000</td>
<td>$14,723,000</td>
</tr>
<tr>
<td>Chronic Disease, Injury Prevention and Behavioral Health Promotion</td>
<td>$62,613,000</td>
<td>$18,935,000</td>
<td>$43,678,000</td>
</tr>
<tr>
<td>Access to and Linkage with Healthcare</td>
<td>$28,501,000</td>
<td>$19,027,000</td>
<td>$9,574,000</td>
</tr>
</tbody>
</table>

**TOTAL** | **445,568,000** | **278,231,000** | **167,337,000**

Source: Habile, 2019.

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2 These values are all presented in current year dollars (appropriately 2018 or 2019 dollars). If the results of this analysis were to be inflated for comparability in future years, they should be inflated from 2018 purchasing power.
The “additional increment” represents the additional spending that would need to occur to achieve the incremental increase in capacity and expertise to support full implementation of CPHS statewide. This “additional increment” does not necessarily represent the additional revenues needed to fully implement CPHS, as that value is dependent on alignment of funding responsibilities and the security, predictability, and flexibility of existing revenues as discussed later in this Report.

Exhibit 39 further illustrates the distribution. Most of this distribution makes sense, the upstream activities (that is, the types of services like overhead and infrastructure building activities) are more implemented than some of the downstream activities designed to improve population health (the population-based, enabling, and direct health care services).

This trend is most evident when considering Chronic Disease, Injury Prevention, and Behavioral Health Promotion, as only 30% of the full implementation cost is current spending.

It is important to remember that population-based, enabling, and direct health care services are interdependent on overhead and infrastructure building activities, so the significant gaps in spending on those activities may also impact the ability of governmental...
public health to implement population-based, enabling, and direct health care services.

The full implementation cost estimate (as well as estimates of current spending and the additional increment of spending to achieve full implementation) are point-in-time, planning-level estimates of the regular, annual costs to the governmental public health system on just CPHS, a subset of public health services.

It is important to remember that the CPHS framework is not static because of the evolving nature of public health work, which will need to be reflected in future updates to the CPHS framework and operational definitions, and may impact these estimates.

Further, these results are based on the current service delivery paradigm, which may be optimized to increase efficiency and effectiveness as part of the broader public health system transformation effort. When considering these results in the future, adjustments should be made to ensure that they are comparable with current assumptions and purchasing power.

This Needs Assessment is an early step in an evolving public health system transformation effort. It is likely that these cost estimates will continue to be refined as implementation progresses.

As Exhibit 40 and Exhibit 41 show, an additional $167,337,000 of spending on CPHS would be needed to fully implement it. CDPHE is approximately 39% of this need, while LPHAs are approximately 61%.

This distribution of the additional increment of cost to CDPHE and LPHAs is the same as the distribution of their current spending. That is, based on the existing service delivery paradigm, CDPHE will represent approximately 39% of the governmental public health system’s “on the ground” spending on full implementation of CPHS, while LPHAs will represent about 61%.

The CDPHE and LPHA columns of Exhibit 4040 and Exhibit 41 show, respectively, the distribution of CDPHE and LPHAs’ additional increment of cost to achieve full implementation of CPHS.

As in the case of current spending, there is significant variation between CDPHE and LPHAs spending needs. The most striking difference between CDPHE and LPHAs needs for achieving full implementation, is that LPHAs needs are more concentrated in the foundational capabilities (46% of their overall need is there) than CDPHE’s which are highly concentrated in the foundational services (76% of their needs fall into the foundational services).

In particular, CDPHE has significant spending needs related to function B.2.c. Environmental Health Investigations, Inspections, Sampling and Lab Analysis and the entire foundational service B.3. Chronic Disease, Injury Prevention, and Behavioral Health Promotion. LPHAs needs related to the additional increment of spending needed to fully implement CPHS seem to be fairly evenly distributed across the framework.

An interesting note, is that even though CDPHE is already spending very little on B.2.e. Land Use Planning and Climate Change, the agency doesn’t report a significant increment of new funding needed to fully implement this function. This seems to confirm that this function is not truly a role of CDPHE, bringing
## Exhibit 40. Additional Increment of Cost by Function, Foundational Capabilities

<table>
<thead>
<tr>
<th>A. Foundational Capabilities</th>
<th>CDPHE</th>
<th>LPHAs</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assessment and Planning:</td>
<td>$7,794,000</td>
<td>$6,693,000</td>
<td>$14,487,000</td>
</tr>
<tr>
<td>a. Data Collection and Distribution</td>
<td>$1,334,000</td>
<td>$1,652,000</td>
<td>$2,986,000</td>
</tr>
<tr>
<td>b. Data Access, Analysis and Interpretation</td>
<td>$1,423,000</td>
<td>$1,360,000</td>
<td>$2,783,000</td>
</tr>
<tr>
<td>c. Health Assessment Development, Implementation and Evaluation</td>
<td>$1,133,000</td>
<td>$1,598,000</td>
<td>$2,731,000</td>
</tr>
<tr>
<td>d. Vital Records</td>
<td>$1,425,000</td>
<td>$1,726,000</td>
<td>$3,151,000</td>
</tr>
<tr>
<td>e. Public Health Laboratory (State and Regional Lab Role Only)</td>
<td>$2,479,000</td>
<td>$357,000</td>
<td>$2,836,000</td>
</tr>
<tr>
<td>2. Communications:</td>
<td>$1,015,000</td>
<td>$6,514,000</td>
<td>$7,529,000</td>
</tr>
<tr>
<td>a. Media Communications</td>
<td>$231,000</td>
<td>$1,467,000</td>
<td>$1,698,000</td>
</tr>
<tr>
<td>b. Public Communications</td>
<td>$393,000</td>
<td>$3,934,000</td>
<td>$4,327,000</td>
</tr>
<tr>
<td>c. Internal and Partner Communications</td>
<td>$391,000</td>
<td>$1,113,000</td>
<td>$1,504,000</td>
</tr>
<tr>
<td>3. Policy Development and Support:</td>
<td>$180,000</td>
<td>$5,777,000</td>
<td>$5,957,000</td>
</tr>
<tr>
<td>a. Policy Development</td>
<td>$38,000</td>
<td>$2,047,000</td>
<td>$2,085,000</td>
</tr>
<tr>
<td>b. Policy Enactment</td>
<td>$53,000</td>
<td>$1,688,000</td>
<td>$1,741,000</td>
</tr>
<tr>
<td>c. Policy Evaluation</td>
<td>$89,000</td>
<td>$2,042,000</td>
<td>$2,131,000</td>
</tr>
<tr>
<td>4. Partnerships:</td>
<td>$207,000</td>
<td>$2,691,000</td>
<td>$2,898,000</td>
</tr>
<tr>
<td>a. Partner and Community Relationships</td>
<td>$207,000</td>
<td>$2,691,000</td>
<td>$2,898,000</td>
</tr>
<tr>
<td>5. Organizational Competencies:</td>
<td>$3,240,000</td>
<td>$13,893,000</td>
<td>$17,133,000</td>
</tr>
<tr>
<td>a. Accountability, Performance Management and Quality Improvement</td>
<td>$1,776,000</td>
<td>$2,038,000</td>
<td>$3,814,000</td>
</tr>
<tr>
<td>b. Human Resources</td>
<td>$66,000</td>
<td>$1,847,000</td>
<td>$1,913,000</td>
</tr>
<tr>
<td>c. Legal Services and Analysis</td>
<td>$0</td>
<td>$1,112,000</td>
<td>$1,112,000</td>
</tr>
<tr>
<td>d. Financial Management, Contract and Procurement Services, and Facilities Management</td>
<td>$699,000</td>
<td>$4,346,000</td>
<td>$5,045,000</td>
</tr>
<tr>
<td>e. Information Technology/Informatics (IT)</td>
<td>$565,000</td>
<td>$2,289,000</td>
<td>$2,854,000</td>
</tr>
<tr>
<td>f. Leadership and Governance</td>
<td>$134,000</td>
<td>$2,261,000</td>
<td>$2,395,000</td>
</tr>
<tr>
<td>6. Emergency Preparedness and Response:</td>
<td>$2,252,000</td>
<td>$4,465,000</td>
<td>$6,717,000</td>
</tr>
<tr>
<td>a. Public Health Preparedness and Response Strategies and Plans</td>
<td>$1,186,000</td>
<td>$1,727,000</td>
<td>$2,913,000</td>
</tr>
<tr>
<td>b. Emergency Support Function 8</td>
<td>$372,000</td>
<td>$1,034,000</td>
<td>$1,406,000</td>
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<tr>
<td>c. Emergency Response</td>
<td>$310,000</td>
<td>$763,000</td>
<td>$1,073,000</td>
</tr>
<tr>
<td>d. Community Preparedness</td>
<td>$384,000</td>
<td>$941,000</td>
<td>$1,325,000</td>
</tr>
<tr>
<td>7. Health Equity and the Social Determinants of Health:</td>
<td>$1,123,000</td>
<td>$6,473,000</td>
<td>$7,596,000</td>
</tr>
<tr>
<td>a. Leadership and Workforce Training and Diversity</td>
<td>$603,000</td>
<td>$2,499,000</td>
<td>$3,102,000</td>
</tr>
<tr>
<td>b. Health Equity Policy</td>
<td>$110,000</td>
<td>$979,000</td>
<td>$1,089,000</td>
</tr>
<tr>
<td>c. Health Equity Data</td>
<td>$110,000</td>
<td>$1,020,000</td>
<td>$1,130,000</td>
</tr>
<tr>
<td>d. Health Equity Partnerships</td>
<td>$200,000</td>
<td>$861,000</td>
<td>$1,061,000</td>
</tr>
<tr>
<td>e. Health Equity Communications</td>
<td>$100,000</td>
<td>$1,114,000</td>
<td>$1,214,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Share of CPHS Grand Total</th>
<th>24%</th>
<th>46%</th>
<th>37%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPHS GRAND TOTAL</td>
<td>$65,594,000</td>
<td>$101,743,000</td>
<td>$167,337,000</td>
</tr>
</tbody>
</table>

Source: Habile, 2019.
### Exhibit 41. Additional Increment of Cost by Function, Foundational Services

<table>
<thead>
<tr>
<th>Foundational Services</th>
<th>CDPHE</th>
<th>LPHAs</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Communicable Disease Prevention, Investigation and Control:</strong></td>
<td>$49,783,000</td>
<td>$55,237,000</td>
<td>$105,020,000</td>
</tr>
<tr>
<td>a. Communicable Disease Prevention</td>
<td>$6,740,000</td>
<td>$2,170,000</td>
<td>$8,910,000</td>
</tr>
<tr>
<td>b. Identify Communicable Disease Prevention, Investigation and Control A</td>
<td>$980,000</td>
<td>$10,244,000</td>
<td>$11,224,000</td>
</tr>
<tr>
<td>c. Communicable Disease Investigation and Control</td>
<td>$570,000</td>
<td>$2,482,000</td>
<td>$3,052,000</td>
</tr>
<tr>
<td>d. Immunization</td>
<td>$312,000</td>
<td>$1,863,000</td>
<td>$2,175,000</td>
</tr>
<tr>
<td>e. Coordination of Other Communicable Disease Services with Foundational Services</td>
<td>$73,000</td>
<td>$1,630,000</td>
<td>$2,703,000</td>
</tr>
<tr>
<td><strong>2. Environmental Public Health:</strong></td>
<td>$10,422,000</td>
<td>$15,727,000</td>
<td>$26,149,000</td>
</tr>
<tr>
<td>a. Environmental Health Data</td>
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<td>$1,425,000</td>
<td>$1,425,000</td>
</tr>
<tr>
<td>b. Identify Environmental Health Assets</td>
<td>$0</td>
<td>$728,000</td>
<td>$728,000</td>
</tr>
<tr>
<td>c. Environmental Health Investigations, Inspections, Sampling, Lab Analysis</td>
<td>$10,214,000</td>
<td>$5,322,000</td>
<td>$15,536,000</td>
</tr>
<tr>
<td>d. Zoonotic Conditions</td>
<td>$125,000</td>
<td>$1,942,000</td>
<td>$2,067,000</td>
</tr>
<tr>
<td>e. Land Use Planning and Climate Change</td>
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<td>$5,424,000</td>
</tr>
<tr>
<td>f. Coordination of Other Environmental Health Services with Foundational Services</td>
<td>$83,000</td>
<td>$886,000</td>
<td>$969,000</td>
</tr>
<tr>
<td><strong>3. Maternal, Child, Adolescent, and Family Health:</strong></td>
<td>$2,500,000</td>
<td>$12,223,000</td>
<td>$14,723,000</td>
</tr>
<tr>
<td>a. Maternal, Child, Adolescent and Family Health Information</td>
<td>$230,000</td>
<td>$1,554,000</td>
<td>$1,784,000</td>
</tr>
<tr>
<td>b. Identify Maternal, Child, Adolescent and Family Health Assets</td>
<td>$229,000</td>
<td>$1,167,000</td>
<td>$1,396,000</td>
</tr>
<tr>
<td>c. Collaborative Efforts around Maternal, Child, Adolescent, and Family Health</td>
<td>$456,000</td>
<td>$2,916,000</td>
<td>$3,372,000</td>
</tr>
<tr>
<td>d. Maternal, Child, Adolescent and Family Health Improvement</td>
<td>$1,402,000</td>
<td>$5,852,000</td>
<td>$7,254,000</td>
</tr>
<tr>
<td>e. Mandated Newborn Screening (State Role Only)</td>
<td>$42,000</td>
<td>*</td>
<td>$42,000</td>
</tr>
<tr>
<td>f. Coordination of Other Maternal, Child, Adolescent and Family Health Services</td>
<td>$141,000</td>
<td>$734,000</td>
<td>$875,000</td>
</tr>
<tr>
<td><strong>4. Chronic Disease, Injury Prevention, and Behavioral Health Promotion:</strong></td>
<td>$33,133,000</td>
<td>$10,545,000</td>
<td>$43,678,000</td>
</tr>
<tr>
<td>a. Chronic Disease, Injury Prevention, and Behavioral Health Promotion D</td>
<td>$7,308,000</td>
<td>$1,975,000</td>
<td>$9,283,000</td>
</tr>
<tr>
<td>b. Chronic Disease, Injury Prevention and Behavioral Health Promotion As</td>
<td>$7,107,000</td>
<td>$2,853,000</td>
<td>$9,960,000</td>
</tr>
<tr>
<td>c. Chronic Disease, Injury Prevention and Behavioral Health Promotion Po</td>
<td>$11,785,000</td>
<td>$4,085,000</td>
<td>$15,870,000</td>
</tr>
<tr>
<td>d. Coordination of Other Chronic Disease, Injury Prevention, and Behavioral Promotion Services with Foundational Capabilities and Services</td>
<td>$6,933,000</td>
<td>$1,632,000</td>
<td>$8,565,000</td>
</tr>
<tr>
<td><strong>5. Access to and Linkage with Health Care:</strong></td>
<td>$2,001,000</td>
<td>$7,573,000</td>
<td>$9,574,000</td>
</tr>
<tr>
<td>a. Collaborative Efforts Around Access to Clinical Care</td>
<td>$123,000</td>
<td>$2,330,000</td>
<td>$2,453,000</td>
</tr>
<tr>
<td>b. Access to Clinical Care Data</td>
<td>$65,000</td>
<td>$961,000</td>
<td>$1,026,000</td>
</tr>
<tr>
<td>c. Health Facility Inspection and Licensure (State Role Only)</td>
<td>$960,000</td>
<td>$0</td>
<td>$960,000</td>
</tr>
<tr>
<td>d. Linkage to Clinical Care</td>
<td>$853,000</td>
<td>$4,282,000</td>
<td>$5,135,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Share of CPHS Grand Total</th>
<th>76%</th>
<th>54%</th>
<th>63%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPHS GRAND TOTAL</td>
<td>$65,594,000</td>
<td>$101,743,000</td>
<td>$167,337,000</td>
</tr>
</tbody>
</table>

Source: Habile, 2019.
into question whether and how it should be bounded within the CPHS framework.

Exhibit 42 shows the distribution of the additional increment of spending needed by CDPHE and LPHAs to achieve full implementation of CPHS across the foundational capabilities and services, and drilled down to the function level.

In contrast with the distribution of current spending shown in Exhibit 42, you can see that the additional increment of spending needed is much more evenly distributed with the exception of a significant need to support foundational service B.4. Chronic Disease, Injury Prevention, and Behavioral Health Promotion. This is largely due to the fact that CDPHE expects to need an additional $33 million to fully implement that service.

There are several areas where CDPHE expects to need very few additional resources to fully implement CPHS, including A.2. Communications, A.3. Policy Development and Support, and A.4. Partnerships.

However, these findings may be somewhat erroneous, in the sense that they might belie significant shifts/centralization/decentralization of resources within CDPHE, as a result of “transformative thinking” that is recategorizing existing resources such that a greater share of full implementation costs represent new resources than what the additional increment of spending alone.

Exhibit 42. Distribution of Additional Increment of Cost for CDPHE and LPHAs by Foundational Capability and Service and Function

<table>
<thead>
<tr>
<th>A. FOUNDATIONAL CAPABILITIES</th>
<th>CDPHE</th>
<th>LPHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assessment and Planning</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td>2. Communications</td>
<td>10%</td>
<td>1%</td>
</tr>
<tr>
<td>3. Policy Development and Support</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>4. Partnerships</td>
<td>3%</td>
<td>1%</td>
</tr>
<tr>
<td>5. Organizational Competencies</td>
<td>1%</td>
<td>3%</td>
</tr>
<tr>
<td>6. Emergency Preparedness and Response</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>7. Health Equity and Social Determinants of Health</td>
<td>1%</td>
<td>2%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. FOUNDATIONAL SERVICES</th>
<th>CDPHE</th>
<th>LPHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Communicable Disease Prevention, Investigation and Control</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>2. Environmental Public Health</td>
<td>16%</td>
<td>16%</td>
</tr>
<tr>
<td>3. Maternal, Child, Adolescent and Family Health</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>4. Chronic Disease, Injury Prevention and Behavioral Health Promotion</td>
<td>11%</td>
<td>11%</td>
</tr>
<tr>
<td>5. Access to and Linkage with Health Care</td>
<td>11%</td>
<td>11%</td>
</tr>
</tbody>
</table>

Source: Habile, 2019.
While the estimate of $167,337,000 is a reasonable basis to describe the additional spending that could be needed to fully implement CPHS, for planning purposes we have elected to present the final full implementation costs as a range, with a contingency to address the potential unknowns in estimating future needs.

The contingency is based regression of the governmental public health agency-level full implementation cost estimates with population and poverty rate. This provided best fit coefficients that could be used to estimate the full cost of implementation for Colorado’s governmental public health agencies, which results in an alternative estimate that is approximately $21,390,000 more than the baseline estimate.

As a result, the full implementation costs, as shown in Exhibit 43, below represent a planning-level, point-in-time estimate of the regular, annual costs for fully delivering CPHS.

These costs do not include potential one-time costs of associated with implementation. The total resources that may be required to move from current implementation of CPHS to full implementation may include things like the cost of hiring beyond normal annual hiring, ergonomic or other facility assessments to support housing of additional staff, organizational development and change management, and the policy work needed to support the CPHS initiative overall.

It is expected that these costs will be material. However, governmental public health agencies communicated that these costs would be highly dependent on how full implementation of CPHS was phased, and so they could not be accurately estimated as part of this Needs Assessment.

Exhibit 43. Full Implementation Cost, including Additional Increment of Cost, of Fully Implementing CPHS with Contingency

<table>
<thead>
<tr>
<th>Current Spending: $278,231,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional Increment: $167,337,000</td>
</tr>
<tr>
<td>Full Implementation Cost: $445,568,000</td>
</tr>
<tr>
<td>Full Implementation Cost with Contingency: $466,958,000</td>
</tr>
<tr>
<td>Additional Increment with Contingency: $188,727,000</td>
</tr>
</tbody>
</table>

Source: Habile, 2019.
Exhibit 44 shows the distribution of the full implementation costs for CPHS, for CDPHE and LPHAs across the foundational capabilities and services, and drilled down to the function level. We provided this exhibit to show the distribution among the varying foundational capabilities and services, for two reasons.

First, for comparison with Exhibit 37 ("Distribution of Current Spending for CDPHE and LPHAs by Foundational Capability and Service and Function, (S)FY 2018") and Exhibit 42 ("Distribution of Additional Increment of Cost for CDPHE and LPHAs by Foundational Capability and Service and Function"). Second, to demonstrate the difference in the “size and shape” of the various foundational capabilities and services, and functions.

This exhibit demonstrates that some of the foundational capabilities and services, and functions, are much larger than others. On its own, this fact is not meaningful, however, there are a few foundational capabilities and services, and functions that include several somewhat disparate things, together; separating these activities may strengthen the framework while improving the granularity of cost information. Examples include:

- **B.4 Chronic, Disease, Injury Prevention, and Behavioral Health Promotion** has four functions with transferable activities that are meant to be applied to all three subject matter areas in the foundational service title (chronic disease, injury prevention, and behavioral health

### Exhibit 44. Distribution of Full Implementation Costs for CDPHE and LPHAs by Foundational Capability and Service and Function

<table>
<thead>
<tr>
<th>A. FOUNDATIONAL CAPABILITIES</th>
<th>CDPHE</th>
<th>LPHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assessment and Planning</td>
<td>9%</td>
<td>15%</td>
</tr>
<tr>
<td>2. Communications</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>3. Policy Development and Support</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>4. Partnerships</td>
<td>1%</td>
<td>4%</td>
</tr>
<tr>
<td>5. Organizational Competencies</td>
<td>1%</td>
<td>8%</td>
</tr>
<tr>
<td>6. Emergency Preparedness and Response</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>7. Health Equity and Social Determinants of Health</td>
<td>1%</td>
<td>2%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. FOUNDATIONAL SERVICES</th>
<th>CDPHE</th>
<th>LPHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Communicable Disease Prevention, Investigation and Control</td>
<td>20%</td>
<td>3%</td>
</tr>
<tr>
<td>2. Environmental Public Health</td>
<td>17%</td>
<td>1%</td>
</tr>
<tr>
<td>3. Maternal, Child, Adolescent and Family Health</td>
<td>10%</td>
<td>2%</td>
</tr>
<tr>
<td>4. Chronic Disease, Injury Prevention and Behavioral Health Promotion</td>
<td>5%</td>
<td>1%</td>
</tr>
<tr>
<td>5. Access to and Linkage with Health Care</td>
<td>5%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Source: Habile, 2019.
Non-financial Barriers to Implementation of CPHS

To fully implement CPHS, it is important that the governmental public health agencies have enough resources to carry out their work. However, some agencies may face non-financial barriers that can limit their ability to implement the services effectively. These barriers include issues related to policies, regulations, and other factors that may affect the implementation process.

To understand these barriers, we conducted a needs assessment and gathered information from governmental public health agencies. We found that some agencies were having trouble implementing CPHS due to non-financial barriers.

The non-financial barriers identified include both systemic and specific barriers to implementation. These barriers can be overcome with careful planning and resource allocation. By addressing these barriers, governmental public health agencies can ensure that they are able to fully implement CPHS and provide the best possible services to their communities.
In addition to addressing existing barriers, implementation efforts should not create new barriers. The information herein can be useful to identifying ways to increase the implementation of CPHS, while preventing additional barriers. It can also be useful to prevent over-investment in areas where full implementation will not be achievable without removal of a non-financial barrier.

Knowing this, we should not only leverage the data to work to eliminate the barriers described, but also look at what it tells us about where there might be other similar barriers, due either to the nature of the foundational capability or service, function, element, or activity, or the size, population density, population served, structure, or governance of the governmental public health agency.

Even with the findings and insight documented herein, there is a need to continue exploring barriers to implementation in the existing and future system, as each implementation decision may create barriers as an externality.

In particular, service interdependencies among foundational capabilities or services, functions, elements, or activities and relationship interdependencies between or among governmental public health agencies could create barriers to, or at least, inefficiencies in implementation.

We cross-tabulated our analysis of non-financial barriers to full implementation, to understand whether any of these non-financial barriers might be specific to governmental public health agencies of a certain size, structure, governance, or even population density.

Where this is true, we’ve provided descriptive information about the LPHAs who cited the barrier. Where CDPHE cited barriers that are specific to their unique context as the state-level governmental public health agency, we have attributed their comments.

**Relationship and Communication with the Public and Policy Makers**

- Governmental public health agencies of all sizes cited lack of knowledge of or competing perceptions of the role of the governmental public health system as a non-financial barrier to CPHS, in that there was not agreement around what services they should deliver, or, if there was, they had not been clearly articulated such that there was shared understanding among policymakers, staff, constituents, and patrons.
  - One district LPHA expressed that this was particularly true for district LPHAs as they served multiple counties with distinct needs and diverse political views.
  - Along with lack of knowledge of the role of the governmental public health system, one LPHA communicated that it continues to struggle to communicate the services it offers to the community and the work it does in general.

- A couple of agencies expressed that their community has a negative perception of them, as an agency. This seems to be isolated to those agencies, rather than a global perception about governmental public health agencies.

- In the same vein, several governmental public agencies communicated that the current political climate, and, in particular, mistrust of government was a challenge to their relationships with the community.
  - Several rural and frontier counties stated that a portion of their population lives “off the grid,” and does not want any relationship with government.

  However, as CPHS are “needed everywhere to work anywhere” it is still imperative that these be served by or benefit from CPHS. However, these LPHAs communicated that such residents might actively reject their services.

- LPHAs also cited a lack of political support or championing of public health at the local, state, and federal levels as a major barrier to full implementation of CPHS, both because
  - It’s hard to say whether lack of political support or championing by policy makers is due to lack of community support or vice versa. More than likely, they are
mutually reinforcing.
- LPHAs pointed to lack of political support and the challenging political climate as a barrier to policy changes that support population health, stating that these policy changes often require the community to be flexible and adapt, which community members may not be willing to do.
- In turn, policy makers may not be willing to spend political capital on (that is, they won’t implement policies that may lead to the short term discomfort of the community), even when policy changes are evidence-based.
  - A few LPHAs pointed out that lack of support for policy change have led to perception among their staff members that innovation and creativity will be quashed.
  - A few LPHAs governed by their BOCC serving as the local BOH, communicated that, since the BOH is the BOCC and there are no members that have medical or public health background it is a constant and persistent fight to educate and re-educate with each encounter with the members.
  - On the other hand, a few small and extra small LPHAs communicated that their agencies are increasingly being invited, or even expected, at the table for a wide-range of initiatives related to the social determinants of health. While this is positive, many of these LPHAs are financially constrained such that they have to be very selective about these opportunities, missing out on some that could be important to improving population health.
  - Many LPHAs communicated that public engagement is an important part of their work, but that their communities are fatigued from continual public engagement, not only from the LPHAs but related to other policy initiatives in the community. These competing priorities can disperse the focus and value of public engagement efforts.
  - Several LPHAs shared that they are working to engage members of the public beyond the “usual suspects.” This includes new residents, as well as residents who face barriers to participation and say that it can be challenging to find methods to reach these residents.
  - Further, they stated that there are some members of their communities that actively do not want to be engaged.
  - A couple of LPHAs stated that their community members struggle to grasp health equity concepts and principles, as equity is a “dirty word” in their community – conflated with reduction of opportunity for those who are already historically better served.
- The only single-county LPHA coordinating with a quasi-governmental agency cited their unique structure, both due to it’s uniqueness but also due to competing roles and the need for a high degree of ongoing collaboration between the two coordinating agencies, as a challenge.
- Several rural and frontier communities, particularly those west of the Continental Divide, said that the travel requirements to participate in system-level policy work could sometimes be prohibitive to their participation.
- Several communities west of the continental divide stated that there were significant physical barriers to their travel, especially in the winter months due to mountain passes and inclement weather.
- Several LPHAs with both main and satellite offices communicated that travel between their offices was a barrier to their work, due to the time and cost of maintaining multiple locations, and traveling between them.
- A few LPHAs identified that their current facilities cannot accommodate additional staff, but that they won’t (either due to county-level decision making or resources) acquire a larger facility.

Data
- Several LPHAs suggested that lack of interoperability and compatibility among data systems and information sharing was a challenge in the existing system.
- Many small and extra-small LPHAs pointed
out that there was a demand for data and evidence to support decision making, but that much of the community-level data they have access to is suppressed due to the size of their population.

Demand for and Access to Services

- Several LPHAs, particularly medium, large, and extra large LPHAs, stated that population growth was leading to growth in demand for services which was outpacing funding and resources, which was unsustainable for their agencies.

- One LPHA stated that there was little work being done on upstream social determinants of health that lead to inequitable health outcomes, in their community. That LPHA worried that this would unsustainably increase demand for services downstream for the LPHA.

- One rural LPHA identified at service eligibility is a particular issue for agricultural families, as they are only eligible for services intermittently. While these families may need or at least benefit from services, they don’t want to do all the work it takes to qualify in the short periods they are eligible, only to lose eligibility and have to reapply the next time they are eligible.

- Further, many LPHAs identified that there is a need for additional “enabling services” to support their residents in accessing services. The “enabling services” noted varied, and included things like culturally and linguistically appropriate services, longer office hours, office hours outside of traditional business hours, child care, and transportation.

- Many LPHAs noted that awareness of service availability and an understanding of eligibility for some services was a primary barrier to service access.

Workforce

- Many LPHAs identified recruitment of appropriately trained public health workforce as a barrier to implementation of CPHS. Several reasons that recruitment was identified as challenging were given, including:
  - Availability of workforce with appropriate education and experience (in particular, registered nurses and other degreed professionals)
  - Cost of living and housing
  - Limited housing
  - Low unemployment rates and high competition for staff
  - County salary schedules below market rate
  - Competition with clinical health care and other sectors
  - Lack of perceived opportunities for upward mobility in smaller LPHAs
  - Competition among counties, which disadvantages rural and frontier communities
  - Disinterest in living in rural, frontier, and resort communities

- Many of these same LPHAs identified turnover of workforce as a challenge. Several LPHAs even identified that there was cannibalization within the system - that is, the governmental public health system was actually increasing the issue of turnover by competing for and poaching staff among governmental public health agencies.

- Some LPHAs communicated that many of their staff members are close to retirement and that they expect there will be a void, yet, their agencies haven’t done succession planning to prepare for this eventuality.

- Several LPHAs suggested that there was a need for system-level onboarding for new governmental public health staff in Colorado, and that due to turnover issues, this shouldn’t be an agency responsibility as it would disadvantage smaller agencies where people might start out before moving on to larger agencies.

Funding Mechanisms

- Most LPHAs identified that the restrictions on most of their funding (that is, the fact that most of their funding is categorical) was a barrier to their work.

- One of these LPHAs also expressed that in the course of blending and braiding categorical funding streams, public health work can become very siloed.
LPHAs also identified that they are spending a significant amount of time managing these grants and other categorical funding sources. In particular, they mentioned competing for grants, generating deliverables, obtaining enough funding to meet match requirements, and participating in evaluation processes as taking up valuable capacity for CPHS work.

Recognizing that the state issues grant funds on a reimbursable basis, some LPHAs, particularly smaller LPHAs, pointed out that the delay in reimbursement, especially for large grants, can be a barrier to agencies.

There is a need for CDPHE to be extremely timely in making reimbursements, however, even with timeliness the reimbursable nature of these grants may mean that some agencies spend these resources more slowly/in smaller increments than they would a cash revenue.

One LPHA suggested there is a need for a shared portal for contract monitoring and reporting.

Several LPHAs pointed out that the fees they charge for services are set somewhat arbitrarily, don’t increase with inflation, and don’t fully cost recover.

However, one LPHA pointed out that, as public health plays an important assurance function related to direct health care services that agencies may not want to charge fees for service or may not care about full cost recovery.

Another LPHA identified that differences in patient charges versus patient payments (due to ability to pay) can lead to bad debt.

Most LPHAs pointed out that the insecurity and unpredictability of funding from year to year was a barrier to long term planning and capital investment in their work.

One LPHA said that their agency is no longer going after short-term grants as it is too inefficient to set-up a new program only to have funding end before a sustainable funding source can be identified.
Discussion
Implementation Considerations

Strategies for Achieving Full Implementation

Colorado public health system transformation is focused on providing a defined package of core services statewide in a fiscally responsible and balanced way by:

- “Right-sizing” governmental public health’s role and scope of services;
- Optimizing the efficiency and effectiveness in delivery of services;
- Defining level of service standards; and,
- Increasing funding and aligning funding responsibility to accountability for services throughout the system.

The CPHS Needs Assessment clearly identifies the governmental public health system’s needs for achieving full implementation of CPHS, including the additional increment of spending needed to achieve full implementation. However, additional spending alone is not sufficient to transform the governmental public health system and fully implement CPHS.

In fact, as discussed previously in this Report, prior governmental public health fiscal sustainability efforts have had limited success, in large part because they are too narrowly focused on increasing funding, but also because it has, historically, been difficult to articulate what public health funding would buy and the long term effect of those dollars.

A major area of focus for transformation efforts moving forward will be determining how to most effectively and efficiently close the identified gaps in core services and capabilities. Toward this end, we believe that increasing the magnitude, flexibility, predictability and security of governmental public health system funding will be just one element of achieving full implementation of CPHS.

Consistent with the overall vision for Health Transformation, additional funding will need to be combined with: (1) continuing to define and refine the governmental public health system’s role; (2) optimizing the efficiency and effectiveness of the service delivery system; and (3) eliminating non-financial barriers to implementation.

Continuing to Define and Refine the Governmental Public Health System’s Role

One of the most significant opportunities for achieving full implementation of CPHS, is to “right-size” CPHS as a suite of services, and with it, the role of the governmental public health system.

The codification of CPHS definitions in administrative rule was (at the time it was implemented by the 2008 Public Health Reauthorization Act) and continues to be to define the Colorado governmental public health system’s role in protecting the public’s health. The idea was, that CPHS are so critical that they are required by state law to be available to everyone, everywhere in Colorado.

However, it is expected that this role, and in particular CPHS themselves will continue to evolve with the public health practice, emergency health and environmental issues, and ongoing change in the relationship between governmental public health and clinical care.

However, it must be acknowledged that changes to the CPHS definitions are the easiest mechanism by which to affect implementation. That is, if you reduce the CPHS suite of services you can easily increase implementation. Conversely, increasing the CPHS suite of services is likely to decrease implementation.

Optimizing the Efficiency and Effectiveness of the Service Delivery System

As discussed on page # in the Defining the Existing Governance and Service Delivery Paradigm section of this report, much of the governance and delivery of governmental
public health services is bifurcated to “state-
centralized” and “locally-decentralized,”
despite the options for governance and
service delivery being much broader than that
(through cross jurisdictional delivery).

The models in use in Colorado are not
inclusive of all potential cross jurisdictional
delivery models. The models, as well as the
expression of the models in Colorado, also
vary significantly in formality.

Further, because of the dramatic
change in governmental public health
structure and governance related to
the implementation of the 2008 Public Health
Act, it can be assumed that many of the cross
jurisdictional delivery relationships on which
these models are based have been developed,
out of necessity, over time. There is a need to
explore and define these models, including,
through assessment of the effectiveness
of existing models. There is also a need to
develop policy infrastructure to support these
models.

Cross jurisdictional service delivery models
are primarily tools that can be used to
address gaps in implementation. In some
cases, implementation of these tools (that is,
cross jurisdictional delivery of a CPHS service
through a cross jurisdictional delivery model)
may increase the efficiency and effectiveness
of the governmental public health system
while closing gaps in implementation.

We asked several assessment questions
around service delivery, including:

- Current sharing in delivery of CPHS
- Benefit of local expertise in delivering
  CPHS services
- Interest in and willingness to share CPHS
  services in the future

Synthesis of this data as well as our
understanding of the gaps in implementation
of CPHS throughout the system can help to
identify opportunities for implementation of
cross jurisdictional delivery models, through
considerations like:

- Identification of most significant
  implementation gaps
- Overall willingness to share

However, we feel strongly and the evidence
in the practice\(^4\) suggests that governmental
public health agencies should have complete
autonomy to identify the services they’d like
to share and who they’d like to share with.

For that reason, we have not made any
suggestions around what services should be
targeted for increases in cross jurisdictional
sharing. Instead, we’ve provided Exhibit 46 to

\(^4\) The Center for Sharing Public Health Services
says that cross jurisdictional delivery works best
when LPHAs have agency in developing these
relationships, working with their natural sharing
partners.
Defining Level of Service Standards

As part of codification of the CPHS definitions, the State Board is also obligated to promulgate by administrative rule, minimum standards for these services. This is another mechanism by which the scope of implementation can be changed.

That is, the intensity of the minimum standards will influence the current level of implementation and future cost of full implementation. It is assumed that the governmental public health system had a sense of what minimum standards might look like for CPHS, which they used to calibrate their responses to the CPHS Needs Assessment.

However, a careful articulation of these minimum standards can be a starting point for understanding what implementation “buys” to help communicate why implementation of CPHS is needed to the public, policy makers, and potential funders.

Increasing the Magnitude, Flexibility, Predictability, and Security of Governmental Public Health System Funding

While it is not the only strategy for achieving full implementation of CPHS that should be considered, there is unequivocally a need for additional funding to support full implementation of CPHS. This funding should be flexible, predictable, and secure. Funding mechanisms should further, support change in costs and demand over time.

The 2020 and beyond legislative sessions provide significant opportunities to make progress in funding Colorado’s public health system, because there will be significant capacity within constitutional Taxpayer Bill of Rights (TABOR) limits for investment in new or additional governmental services and significant resources from rapidly increasing marijuana sales taxes. To increase the chances of success in these future legislative sessions, the system needs effectively communicate the needs for fully implementing CPHS.

Beyond additional governmental sources of funds, the governmental public health system should consider opportunities to recover costs. Many governmental public health agencies already collect fees.

Phasing

As intended, this CPHS Needs Assessment clearly articulates, in a measurable way, the “gaps” between Colorado’s governmental public health system’s current condition and it’s desired one (full implementation of CPHS). Based on the magnitude of these gaps, it can be assumed that full implementation of CPHS will necessarily be a multiyear, phased process.

However, the CPHS Needs Assessment cannot on its own provide a systemic workplan for addressing these needs — fully implementing CPHS — as it could vary significantly based on governmental public health system participants priorities for implementation, like:

- Efficiency
- Effectiveness
- Speed
- Service equity
- Health equity
- Desire to fund the largest or most critical gaps in implementation first
- Flexibility for individual governmental public health agencies in implementation
- Equitable and even funding for LPHAs

It could also vary based on implementation factors outside of the governmental public health system’s control, like:

- Political will and gubernatorial priorities
- The availability and timing of funding and resources
- TABOR limits and restrictions

Based on the variation in implementation across the governmental public health system, it is unlikely that there will be consensus on a one-size-fits-all phasing approach.

For example, an implementation approach that sought to divide agencies into groups and implement in waves, where the focus is to raise the service levels one group at a time would likely lead to significant service inequity throughout the system.
Exhibit 46. Opportunities for Cross Jurisdictional Delivery of Services Based on Minimally and Limitedly Implemented Services and Willingness to Share
Note: Function A.1.e Public Health Laboratory Services, which is a state and regional role only implemented by CDPHE and three LPHAs with regional labs, El Paso County Public Health, Pueblo Department of Public Health and Environment, and Weld Department of Public Health and Environment. Functions B.3.e Mandated Newborn Screening and B.5.c Health Facility Inspection and Licensure are both state roles only. In both cases, governmental public health agencies that do not participate in these roles are "grayed out."

Source: Habile, 2019.
Similarly, implementation by the largest or “most critical” gaps could lead to improvement for some health departments and not others, depending on differences in statewide and local perspectives around “most critical gaps.”

Instead, the governmental public health system should endeavor to develop a flexible approach to phasing that allows for governmental public health autonomy in decision making, while designed to support statewide coordination and provide incentives to encourage efficient and effective implementation. Further, phasing should prevent systemic barriers and consider where interdependencies among governmental public health agencies and services.

Such a bottom up approach to phasing will require a structured accountability and performance management system to track statewide implementation and to demonstrate the value of implementation over time.
Conclusions and Outstanding Questions

Summary of Key Findings

The CPHS Needs Assessment lays out the needs for full implementation of CPHS, and where possible, public health system transformation more broadly. To do this effectively, these needs have to be defined in the context of the existing governmental public health system, with an understanding of existing funding and financing, governance and service delivery paradigm, and current implementation and spending on CPHS.

Understanding of these needs is augmented by understanding of non-financial barriers to implementation and strategies for achieving full implementation. We have identified key findings from all of this analysis.

Further, while the CPHS Needs Assessment Data Collection and Validation Process was implemented to inform a primary dataset to describe the current implementation and spending on and estimate of the full cost of implementing CPHS in Colorado, there are several salient findings from that effort that are also valuable to the overall Needs Assessment.

All of these findings are organized topically, following, to support future considerations around addressing them through public health system transformation initiatives, as discussed in the Next Steps.

CPHS Framework and Operational Definitions

- **Need to build a shared understanding of the new CPHS framework and operational definitions.**
  
  Because there is significant interplay among the foundational capabilities and services governmental public health professionals need to be familiar with the full operational definitions manual, and not simply definitions related to their particular subject matter expertise.

- **Need to continue to refine the CPHS operational definitions.**
  
  One of the areas where advancement is needed is in fleshing out the activities under each element such that they clearly “add up” to the elements, by continuing to articulate the more “intangible” things governmental public health does.

- **The CPHS definitions are intended to be accompanied by regulations setting minimum quality standards, however, those minimum quality standards have not yet been updated for consistency with the updated CPHS definitions.**

- **Updating these minimum quality standards will be an important step in CPHS implementation.**
  
  **The intensity of the minimum quality standards will influence the current level of implementation and future cost of full implementation.**
  
  It is assumed that the governmental public health system had a sense of what minimum standards might look like for CPHS, which they used to calibrate their responses to the CPHS Needs Assessment.

- **Careful articulation of minimum quality standards can be a starting point for understanding what implementation “buys”.**
  
  This will also to help communicate why implementation of CPHS is needed to the public, policy makers, and potential funders.

- **It is expected that the CPHS framework and operational definitions will continue to evolve, with the public health practice.**
  
  Thus, it will be necessary to develop a regular process for updating them, as well as allowances for updates as necessitated by emergent issues.

- **The operational definitions related to some services are at different altitudes than the other foundational capabilities**
and program. This implies that those definitions could be fleshed out more, long term, to better define what it means to operationalize them. This is particularly true for the foundational capability Health Equity and Social Determinants of Health and the foundational service Access to and Linkage with Health Care where they both have several elements and very few, if any, activities.

- For the purposes of this Needs Assessment, we have categorized CPHS functions by type of service. It may be useful to further categorize each element and activity using this schema, rather than relying on function-level categorization, as some functions may include multiple types of services.

- CPHS activities are interdependent; however, the CPHS framework and operational definitions do not have a mechanism to identify and incorporate the relationships among them. Types of services give us a broad framework for general interdependencies; that is we know that, generally, overhead services, support infrastructure-building services, which in turn support population-based services, which support enabling services and, ultimately, direct health care services. However, it could be useful to complete a network analysis to better understand these relationships and potential interdependencies among CPHS operational definitions before pursuing full implementation of CPHS, to prevent them from becoming barriers to implementation as full implementation is phased in.

- Review of CRS Title 25 suggests that there may be some minor state-mandated activities that were not captured in existing CPHS operational definitions. Because CPHS are intended to include all state and federally mandated activities, it is important that a review is done to ensure consistency between statute and CPHS operational definitions.

- Changing the CPHS definitions is the easiest mechanism by which to affect implementation. That is, if you reduce the CPHS suite of services you can easily increase implementation. Conversely, increasing the CPHS suite of services is likely to decrease implementation.

**Statute and Regulation**

- There is a need for a review process to “clean up” Title 25: Public Health and Environment to improve the governmental public health agencies understanding and compliance of the statute. The governmental public health system’s work is guided by Title 25 of the Colorado Revised Statures, which is both voluminous, at over 1,000 pages, and quite complex. As part of the analysis in this Needs Assessment, we provided a summary of the existing governmental public health system’s governance and service paradigm, informed by this statute. We identified several instances where clarification of statute could be useful; most notably:
  - Updating counties per capita funding obligations to LPHAs and clarifying the methodology and metrics used to set those obligations, annually.
  - Clarifying the competing roles of the County Clerk and LPHAs in providing services related to vital records.

- The statutes governing CDPHE’s powers and duties and the powers and duties of State Board of Health that governs the agency are incredibly complex. This complexity is largely a function of the historical evolution of the agency and its governance; the statute could be revised to more succinctly and clearly lay out CDPHE and the State Board’s powers and duties.

- In contrast, LPHAs and local board of health powers and duties are succinctly summarized in state law. This is not random - it is the result of careful policy development done in codifying the 2008 Public Health Act.

**Governance and Service**
Delivery Paradigm

- CDPHE is one of only a few state health departments with combined human and environmental health responsibilities and services.

- CDPHE and LPHAs are commonly subordinate to larger government entities, that make both direct and indirect contributions to them in the delivery of governmental public health. These relationships are highly variable and the value is not always captured in analysis of the governmental public health systems’ work, revenues, and expenditures.

- Specifically, state law directs counties (through the County Treasurer, County Attorney, and County Clerk) to provide specific CPHS services.
  
  This poses a philosophical challenge, in bounding the role of governmental public health, particularly because CPHS activities are, by definition, “services for which the governmental public health system is the only or primary provider of the service, statewide.”

- In addition to the State Board of Health, CDPHE and statewide governmental public health activities are governed by additional rulemaking boards and commissions, as well as the CDPHE executive director who has the authority to promulgate certain rules.
  
  Beyond rulemaking boards and commissions, CDPHE operates, manages, and is advised by 35 boards, commissions, committees, councils, task forces, and working groups that do not have rulemaking authority.

  The hierarchy and relationships between the State Board and these other rulemaking boards and commissions and non-rulemaking bodies are somewhat ambiguous, although their end purpose (protecting Colorado’s health and environment) is aligned.

- Colorado’s 64 counties are currently served by 53 LPHAs, with varying governance structures, including both single-county agencies and districts.

- LPHAs, and the counties they serve, often have a strong desire for/to maintain local control (governance and control over their own activities).

  Desire for local control can be in tension with available funding (that is, it can be infeasible for every local governmental public health agency to deliver all of the governmental public health services that may be necessary in their communities, including all of CPHS).

  However, particularly as local expertise can be important to delivery of effective governmental public health services, it’s important to consider the desire to maintain local control in future governance conversations.

- Despite the existence and governance of LPHAs, the State of Colorado, through CDPHE, has authority to preempt local control, if needed.

  If an LPHA is ever unable or unwilling to efficiently abate a nuisance or prevent the introduction or spread of a contagious or infectious disease, the local board of health must notify CDPHE to request assistance. In some cases, CDPHE may, on its own, determine that the LPHA is unwilling or unable to act.

  When this occurs, CDPHE has full authority to ensure the abatement of the nuisance or prevent the introduction or spread of disease.

  For this purpose, CDPHE may assume the LPHA’s powers and may reallocate state monies from the LPHA to another entity to deliver services in the LPHA’s jurisdiction.

- LPHAs are governed by local boards of health, which may, in some cases be supplanted by their board of county commissioners.

  Of the 42 LPHAs eligible to be governed by their board of county commissioners, 25 (almost 60%) elect to do so.

  Although the powers and duties of local boards of health and boards of county commissioners acting as local boards of health do not differ, there is a perception within the governmental public health system that boards of health are more effective and responsive to LPHAs.

  Common reasons given for this perception are that they are more likely to have members with public health experience
and expertise and because their purpose is more narrowly focused on matters of public health importance, versus boards of county commissioners who are concerned with the management of the entire county.

- Some LPHAs have separate advisory committees that provide citizen input to their respective Board of Health. Such advisory committees may be a tool local communities can use to generate political will for governmental public health.

- There is significant politicization of some key governmental public health staff, particularly CDPHE’s executive director and LPHA public health directors. This may present a challenge to the governmental public health system, in that it may lead to increased turnover in CDPHE (with each gubernatorial transition) and LPHA leadership, which is a significant challenge given the influence of the positions.

- Largely, governance and delivery of governmental public health services is bifurcated such that the state agency delivers a subset of services centrally to all Coloradans, while LPHAs deliver other services locally (in a decentralized manner), within their service areas.

- Despite this there are many service delivery options based on partnerships between CPHE and LPHAs or among LPHA’s that offer the potential for increased efficiency and effectiveness of the current system. Existing models for cross jurisdictional delivery of governmental public health services in Colorado, include:
  - Locally-governed, fully decentralized
  - Locally-governed, regionally-delivered services
  - Shared local-local governed, regionally-delivered services
  - Shared state-local governed, decentralized services
  - Regionally-governed, regionally delivered services
  - Shared state-local governed, mostly centralized services
  - State-governed, regionally delivered services
  - State-governed, fully centralized services
The models in use in Colorado are not inclusive of all potential cross jurisdictional delivery models. The models, as well as the expression of the models in Colorado, also vary significantly in formality.

- Some LPHAs have chosen to develop shared programs or functions with other LPHAs, an example of “shared local-local governed, regionally-delivered services” cross jurisdictional delivery. Implementing these shared programs or functions and administering these collaborations can be difficult as there is limited policy infrastructure to support LPHA collaboration.

- There is a need to further explore and define these cross jurisdictional service delivery models, including, through assessment of the effectiveness of existing models. There is also a need to develop policy infrastructure to support these models.

- The benefits of collaboration in service delivery are expected to be substantial. As governmental public health agencies continue to be resource constrained cross jurisdictional service delivery offers the chance to build system capacity in a cost efficient and effective manner.

- Governmental public health agencies should have significant autonomy to identify the services they’d like to share and who they’d like to share with.

While the CPHS Needs Assessment provides data that can help to identify opportunities for implementation of cross jurisdictional delivery models, this effort must also catalyze new conversations.
among governmental public health partnerships.
In particular, there is a need for a process to help organize, support and nurture state and local agencies to identify, evaluate and implement strategies to increase cross jurisdictional delivery of services and to share success stories to further build support for this approach.

- **CDPHE has both relationship/service interdependencies and cross jurisdictional delivery relationships with LPHAs, collectively and individually.**
The provider-agnostic nature of the CPHS Operational Definitions are a challenge to distinguishing these relationship/service interdependencies from sharing occurring between CDPHE and LPHAs.
It would be useful to understand both the cross jurisdictional sharing and relationship interdependencies between CDPHE and LPHAs. While the Needs Assessment primary data gives us a start on this exercise, it will require additional primary research and discussion.

- **While CPHS are defined as a subset of all public health services where the governmental public health system, there are many examples of working with other partners agencies.**
There are opportunities to expand system capacity strategically partnering with other governmental, quasi-governmental, community-based, nonprofit, and even for-profit organizations to deliver CPHS.

As implementation of CPHS proceeds, it will be important to clarify the appropriate roles of these non-governmental public health providers, including broader state and county government, as has been discussed previously. This does not necessarily mean excluding these partners, as cross sector partnerships and collaboration are important to the success of public health system transformation. However, it may mean transitioning the work that they do in service to the governmental public health system to a contracting relationship to maintain governance control over the activities.
In particular, there is a need to clarify county’s participation in the delivery of two CPHS functions:

- **Vital Records.** County clerks are statutorily obligated to record vital statistics related to marriages (C.R.S. 25-2-106), civil unions (C.R.S. 25-2-106.5), and burials (C.R.S. 25-2-111(7)(a)). This is somewhat in conflict with the provision that LPHAs’ duties include the collection of reports of marriages, dissolutions of marriage, and declarations of invalidity of marriage.
These competing roles should be clarified to ensure that governmental public health’s current and full implementation costs related to vital statistics are accurate.

- **Financial Management, Contracts and Procurement Services, and Facilities Management.** Public health funds are managed by county treasurers (an elected position in Colorado counties) as part of their official duties.

### Current Level of CPHS Implementation

- **Findings about current implementation of CPHS don’t communicate what CPHS implementation buys; this asset-based perspective would help communicate why implementation of CPHS is needed to the public, policy makers, and potential funders.**
Understanding what implementation “buys” would entail additional analysis to connect process measures related to the experience of these activities by the community (that is, what the community receives as a function of these activities being implemented) to agency-level implementation information.

- **There are no CPHS functions that are implemented universally across the entire governmental public health system.**
Instead, there are varied gaps throughout the entire system, which vary depending on the individual governmental public health agency.

- **Some Core Functions are currently implemented minimally or on a limited basis across most of the public health**

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5 C.R.S. 25-1-511
system.

Three foundational capabilities and programs (A.3. Policy Development and Support, A.7. Health Equity and Social Determinants of Health, and B.2. Environmental Public Health, and in particular, function B.2.e. Land Use Planning and Climate Change) have a higher concentration of governmental public health agencies that are minimally or limitedly implemented.

- **Overall, there are more functions where extra small LPHAs’ work is minimally or limitedly implemented.**

   However this may not mean that those agencies CPHS work is less implemented overall, as these functions could represent smaller portions of their work.

   On the whole, there are more extra small LPHAs with lower degrees of overall implementation of CPHS, however, this is more likely a function of absolute number of extra small LPHAs than a specific statement about the challenges of serving a small market.

- **Overall, Colorado’s governmental public health system has achieved a basic level of implementation, with CPHS overall approximately 61% implemented.**

   While this composite score is at such an aggregate level that it is a poor of indicator critical system or individual agency gaps in implementation, it may useful as a communication measure for general progress.

   In particular, the composite score may be useful to (1) compare the current degree of implementation to full implementation (i.e., how close to full implementation are we?) and (2) as a system-level metric for long term tracking of implementation (i.e., how much progress are we making in implementing CPHS over time?).

### Current Spending on CPHS

We also used (S)FY 2018 data to generate a statewide estimate for the spending needed to achieve this capacity and expertise in (S) FY 2018. This estimate represents spending on CPHS, and should not be confused with the amount of revenue needed to achieve it.

Key findings around the governmental public health system’s current spending on CPHS, include:

- **Colorado’s governmental public health system spent just over $278 million on CPHS in (S)FY 2018.**

   This level of spending represents approximately $48.90 per capita statewide for services delivered by CDPHE and LPHA. This estimate excludes pass-through spending by CDPHE, which is provided to LPHAs for local services, with the goal of counting only the dollars spent “on the ground” for CPHS.

- **A little less than 39% of the governmental public health system’s “on the ground” spending was done by CDPHE, while approximately 61% was done by LPHAs.**

   The distribution of this spending across the CPHS framework varied significantly between CDPHE and LPHAs. A few surprising differences included:

   - CDPHE reported spending more on B.4.d. Linkage to Clinical Care than LPHAs. This was extremely surprising, as ostensibly, LPHAs are more likely to see patients in a clinical care setting than CDPHE.

     However, digging deeper into the definitions, you can see that two of the activities under this function are related to systems work (B.4.d.I.i. Identify, implement, and promote strategies that improve access to health care services and B.4.d.I.ii. Coordinate efforts with governmental and community partners to link individual to health services), rather than linkage of patients to providers.

   - CDPHE (Colorado’s environmental organization) is spending very little on B.2.e Land Use Planning and Climate Change. However, this seems to be primarily because Land Use Planning is a locally-aligned activity in Colorado, to the extent that a different state agency, focused on local affairs (Colorado Bureau of Local Affairs) is responsible for statewide activities related to land use planning and climate change.

     Because B.2.e Land Use Planning and Climate Change is part of the CPHS
framework and therefore intended to be the role of governmental public health, this presents a philosophical challenge in bounding the role of governmental public health, similar to the case of county clerks delivering vital records in some counties under statutory direction.

- **Over 20 percent of current governmental public health system spending on CPHS supports Organizational Competencies.**
  40 percent of this spending supports Financial Management, Contract and Procurement Services, and Facilities Management, making it over 8.5 percent of total current CPHS spending.
  This is not totally surprising as this function combines several high-value activities and in light of LPHAs comments around the expenses related to competing for much of their funding and meeting reporting and other requirements once they have that categorical funding.
  Many of the functions, elements and activities in Organizational Competencies represent overhead. It would be worth evaluating whether current overhead costs are appropriate, and whether categorical funding sources are appropriately compensating agencies for these costs in their “indirect” rates.

Cost of and Barriers to Full Implementation

- **Continue to assess and refine estimates related to surge, cyclical costs, and emergency response and capital needs.**
  The cost estimates generated by governmental public health agencies will continue to be refined as this process evolves.

- **Communicate that the full implementation estimates generated by this Needs Assessment are for the annual costs of fully delivering the services, and do not include potential implementation costs.**
  As implementation scenarios are considered, the governmental public health system will be more able to estimate any potential one-time costs related to implementation. These estimates will be on top of the annual costs of delivering CPHS.

- **The full, annual cost of implementing CPHS in Colorado would be $445,568,000.**
  This represents approximately $78.32 per capita statewide for services delivered by the governmental public health system. This represents an additional increment of $167,337,000, in current year dollars beyond the current level of spending.
  We also estimated a contingency of $21,390,000 on top of that estimate to address potential variability in the results.
  The full implementation cost estimate (as well as estimates of current spending and the additional increment of spending to achieve full implementation) are point-in-time, planning-level estimates of the regular, annual costs to the governmental public health system on just CPHS, a subset of public health services.
  When considering these results in the future, adjustments should be made to ensure that they are comparable with current assumptions (like the evolving CPHS framework and service delivery paradigm) and purchasing power.

- **The “additional increment” represents the additional spending that would need to occur to achieve the incremental increase in capacity and expertise to support full implementation of CPHS statewide.**
  This “additional increment” does not represent the additional revenues needed to fully implement CPHS, as that value is dependent on alignment of funding responsibilities and the security, predictability, and flexibility of existing revenues as discussed later in this Report.

- **The full implementation cost and additional increment of spending costs do not consider the costs of implementation; that is, the resources that might be required to move from current implementation of CPHS to full implementation.**

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6 These values are all presented in current year dollars (appropriately 2018 or 2019 dollars). If the results of this analysis were to be inflated for comparability in future years, they should be inflated from 2018 purchasing power.
It is expected that these costs will be material. However, they are also likely to be highly dependent on how full implementation of CPHS is phased, and so, should be estimated as part of future phasing and workplan development.

- **Current spending is approximately 62% of the full cost of implementation.**
  Upstream activities (that is, the types of services like overhead and infrastructure building activities) are more implemented than some of the downstream activities designed to improve population health (the population-based, enabling, and direct health care services). Population-based, enabling, and direct health care services are interdependent on overhead and infrastructure building activities, so the significant gaps in spending on those activities may also impact the ability of governmental public health to implement population-based, enabling, and direct health care services.

- **CDPHE is approximately 39% of the additional increment of spending to achieve full implementation, while LPHAs are approximately 61%.**
  This distribution of the additional increment of cost to CDPHE and LPHAs is the same as the distribution of their current spending. That is, based on the existing service delivery paradigm, CDPHE will represent approximately 39% of the governmental public health system’s “on the ground” spending on full implementation of CPHS, while LPHAs will represent about 61%.

- **Even though CDPHE is already spending very little on Land Use Planning and Climate Change, the agency doesn’t report a significant funding need related to this function.**
  This seems to confirm that this function is not truly a role of CDPHE, bringing into question whether and how it should be bounded within the CPHS framework.

- **In some cases, the estimate of the additional increment of spending needed to achieve full implementation might obfuscate significant shifts in resources due to “transformative thinking.”**
  Transformation might require re-categorizing of existing resources such that a greater share than the additional increment of spending alone of full implementation costs represent new resources.

### Funding and Financing

- **The governmental public health system’s ability to understand systemwide funding is limited by a lack of data and tracking.**
  This impedes our ability to understand the overall funding to the governmental public health system by contributor, as well as the overall flexibility, security, and predictability of funding.
  Overall governmental public health system revenues have, both historically and currently, not been tracked on a systemwide basis.
  With additional primary research (largely qualitative) the data collected during the Needs Assessment Data Collection process could be used to generate such a summary.

- **Governmental public health in Colorado is funded by a complex web of funders.**
  Public health funding comes from many sources including tax funds from federal, state, county, and city governments; donations from private funders; contributions from businesses, schools, and recreation facilities, such as pools; and households and homeowners, both through general tax collections and through pay of fees and fines.
  Data indicates that “spend down” of Public Health fund balance is also a non-trivial revenue source for some LPHAs.

- **There is only one explicit, direct funding mechanism for public health: Amendment 35.**
  Although other sources may be considered direct funding mechanisms by some, due to historical funding patterns and commitments, only Amendment 35 (which increased taxes on tobacco products) generates revenues that are directly and specifically allocated to public health, including governmental public health.

- **County’s statutorily-obligated contributions to LPHAs are continuing to erode.**
Counties are obligated to allocate $1.50 per capita to LPHAs for those agencies to be eligible for state public health assistance funds. The $1.50 per capita figure was set in 1946 and would be $20.75 today, if inflation adjusted based on the consumer price index inflation calculator. Further, statute does not define the population figure used to generate this annual contribution, so evidence suggests some LPHAs might be receiving less than they should (in the spirit of the statute) while retaining eligibility for state public health assistance funds.

**Although fees and fines are the only revenue source directly controlled by the governmental public health system, there are no systemwide cost recovery targets for these revenues.**

The cost-recovery of current fees and fines varies by governmental public health agency. There is no system-level guidance on the degree to which costs for any services should be recovered. Further, cash funds like fees contribute towards TABOR revenue limits. For those governmental public health agencies subject to TABOR revenue limits, collection of categorical fees and fines may lead to necessary refunding of general funds (flexible funds). This may create a disincentive for cost-recovery, in some cases.

- Some LPHAs also communicated that their clinical care clients are declining as their focus shifts to population-based services and as more Coloradans have health insurance.

- The remaining clients are least likely to be enrolled in Medicaid/Medicare, have private health insurance, or be able to pay personal fees despite having the greatest need for LPHA assurance services. This leaves LPHAs susceptible to accruing bad debt.

- **Existing categorical revenues overly constrain funding for governmental public health agencies.**

  In most cases categorical funds are restricted to specific uses which can result in governmental public health agencies choosing to pursue certain public health activities based on available funding, when pursuing other activities might actually be more effective or in line with their communities’ priorities.

  In addition, the costs of competing for and maintaining categorical funding can be significant, particularly if a grant includes local matching funds, which draw on scarce flexible dollars. In some cases the overhead charges that are allowable through many grants are insufficient to recover the costs related to grant writing and administration, further limiting an agencies flexible funds.

- **LPHAs perceive that all of their funding sources are insecure and unpredictable.**

  The insecurity and unpredictability of public health has been identified as a non-financial barrier to full implementation of CPHS. In particular, LPHAs report that the cyclical nature of many grant programs is difficult to manage with a professional workforce designed to remain static (beyond necessary growth to address demand) year to year.

- **There is significant annual reversion of governmental public health system funds.**

  In State Fiscal Year 2018, $139,294,352.11 of federal and state revenues were known to have reverted because the funds could not be spent during the budget period which granted the authority. One reason for this is that federal pass-through and state appropriations, grants, and contracts are awarded on a reimbursable basis. Not all agencies have the reserves to quickly or efficiently spend-down their revenues while waiting for reimbursement. This may be due, in part, to the fact that not all LPHAs are operating and maintaining an agency public health fund, as statutorily obligated.

- **LPHAs activities are subject to appropriations.**

  If LPHAs do not receive sufficient appropriations to fulfill all LPHA duties, the local board of health will set priorities for
fulfilling those duties as part of its CHIP.\footnote{C.R.S. 25-1-506(3)(c)}

**Implementation Considerations**

- Based on the variation in implementation across the governmental public health system, it is unlikely that there will be consensus on a one-size-fits-all phasing approach.

The CPHS Needs Assessment cannot on its own provide a systemic workplan for addressing these needs – fully implementing CPHS – as it could vary significantly based on governmental public health system participants priorities for implementation, like:
- Efficiency
- Effectiveness
- Speed
- Service equity
- Health equity
- Desire to fund the largest or most critical gaps in implementation first
- Flexibility for individual governmental public health agencies in implementation
- Equitable and even funding for LPHAs

It could also vary significantly based on implementation factors outside of the governmental public health system’s control, like:
- Political will and gubernatorial priorities
  - The availability and timing of funding and resources
  - TABOR limits and restrictions

**Reporting, Accountability, and Performance Management**

- The CDPHE Needs Assessment Data Collection and Validation Process generated a primary dataset that significantly expands the data available for research and analysis of public health in Colorado.

The dataset defines Colorado’s current governmental public health service delivery paradigm, measures current implementation and spending on CPHS, estimates the cost of full implementation of CPHS, and provides insight into barriers and strategies for achieving full implementation of CPHS.

Counting zeros as a datapoint, the complete primary dataset includes a total of $\# \#$ datapoints. The ancillary information collected from respondents represents thousands of additional data points.

This primary dataset is a product of this Assessment effort in and of itself and will provide researchers and public health practitioners with a new and comprehensive information base that was developed through a standard methodology, in close collaboration with all governmental public health agencies and validated using in a consistent and thorough process.

- Work with LPHAs to develop strategies to better understand the capacity and expertise available to support public health services in their service areas, and not just their own capacity and expertise as an agency.

This information should inform ongoing conversations about cross jurisdictional sharing between sharing partners.

- Encourage all LPHAs to move to using a modified accrual accounting systems as suggested by GASB.

It is possible that cash-basis-accounting agencies might understate expenses and revenues and accrual-accounting agencies might overstate expenses and revenues relative to modified-accrual-accounting agencies.

Without a consistent approach to accounting there will be significant challenges in developing reporting and performance management systems that can provide a consistent and equitable process for measuring and comparing CPHS implementation progress for all agencies.

While consistency is ideal, transitioning to modified accrual accounting may not be possible for all LPHAs as many are subordinate to counties, and therefore, must also be consistent with their counties’ preferred accounting method.
If ongoing tracking and measurement of current spending on CPHS is desired, there is a need to create a streamlined process.

While this could be accomplished as part of CDPHE OPPI’s Annual Report process, another approach may be to develop a uniform chart of accounts.

As part of an ongoing tracking process, the Public Health System Transformation Steering Committee should consider opportunities to allow governmental public health agencies to centrally report some operating costs, like insurance, reception, phones, shared office supplies, and postage.

Governmental public health agencies generally don’t allocate these costs in their own system, so agencies have to allocate them (often by FTE) anyway.

Doing this centrally within a uniform chart of accounts would allow for this allocation to be consistent across the system, improving overall data comparability among governmental public health agencies.

The governmental public health system should also take great care to continue to ensure tracking can be done in such a way as to generate systemwide data that is unduplicated (that is, that public health dollars are only counted when they are spent on the ground, so as not to overstate revenues that might “pass through” multiple governmental public health agencies before being spent.

Key to this may be continued maintenance of CDPHE’s new Expenditures by County and Division analysis, which can be used to “net out” pass through spending from CDPHE to LPHAs.

Regardless of the approach to ongoing tracking taken, there is a need to support extra-small LPHAs (those serving 30,000 or fewer Coloradans) in responding to exercises like this, and the CDPHE OPPI annual report.

CDPHE OPPI Annual Report

- CDPHE OPPI and LPHAs should revisit the current process and schedule for data collection and production of the Annual Report

By working collaboratively, there are likely opportunities to streamline the process and identify an optimal window of time for the development of future Annual Reports that will meet both the reporting requirements and maximize LPHA participation.

Although the CDPHE OPPI Annual Report is generally in late spring to early summer, LPHAs indicated that this is poor timing as their LPHA budgets are due to their boards of health by September 1st.

In addition, through this process it may be possible to update the design of the Annual Report to build on the Assessment effort and support future reporting, research and analytic needs of the governmental public health system.

- There is a need for comprehensive technical assistance and validation in all LPHA reporting to CDPHE.

The validation process was instructive in demonstrating the need for validation despite comprehensive technical assistance. CDPHE OPPI should consider this need in their future Annual Report processes.

Other Issues

- It is difficult for governmental public heath agencies to think transformatively about services and operations in a fiscally constrained environment.

Governmental public health agencies are extremely fiscally constrained, such that many do not have experience with zero-based budgeting exercises, only incremental budgeting. If public health system transformation and full implementation of CPHS proceeds, LPHAs may need zero-based budgeting and other cost estimation training.

- While CPHS are the governmental public health services “needed everywhere to work anywhere,” they are not the governmental public health system’s only needs.

Throughout Colorado, there are other critical public health services that are not available to all who need them, or they are available but insufficient to meet the needs of the community due to the same
fiscal constraints that affect CPHS. These additional needs are related to “state and local priority services” which are no less important than CPHS but very difficult to define and quantify due to variation in their delivery (as they are delivered based on state and community priorities. They may also be delivered by entities beyond the governmental public health system).

Part and parcel with these state and local priority services may be “additional increment of foundational capabilities attributable to state and local priority services” which are a heretofore unaccounted for share of foundational capabilities that represent the additional variable increment of capabilities needed to fully implement state and local priority services.

Agency-level Findings

- **Jackson, Moffat, and Routt County Public Health Agencies are in a time of transition.**
  While these agencies have previously delegated the majority of their LPHA services to a nonprofit, Northwest Colorado Health, they have now begun a process to more directly manage their LPHA responsibilities.

- **One particular District LPHA faces unique a set of unique challenges among its local agency peers.**
  As a result of unrelated and uncoordinated decisions, Silver Thread Public Health District belongs to different All Hazards Regions and Health Statistics Regions, creating unnecessary obstacles to forging successful partnerships with neighboring agencies. The governmental public health system should explore opportunities to align both counties to the same regions to support future partnerships.

**Outstanding Questions**

Although Colorado is at the cutting edge of Public Health System Transformation work, outstanding questions remain.

**Tribal Participation in Public Health Transformation**

As the process continues beyond the Assessment phase, there is question regarding how to incorporate the work of governmental public health providers serving federally-recognized Tribes or working in Indian Country in future work.

Although outside of the Colorado governmental public health system’s current definition of a “governmental” provider, it could be argued that these Tribes are the governmental providers for their members and residents, and, in some cases, may be able to best provide culturally-appropriate services to their members and residents, a population that has historically had inequitable health outcomes.

However, Tribes, as sovereign nations, define their own service populations and are not obligated by state statute, or otherwise, to provide public health services. Further, tribal membership and representation is not limited by residency (that is, Tribes may have members who live all over the world, such that it would be prohibitive to deliver public health services to all of them).

The Southern Ute Indian Tribe and Ute Mountain Tribe likely each likely have their own unique blend of public health services, available to their Tribal members as part of broader clinical services, and services that they receive from CDPHE and LPHAs that serve their members and residents.

The Southern Ute Indian Tribe and Ute Mountain Tribe may choose to have formal, explicit relationships with the State of Colorado/CDPHE and counties/LPHAs, however, as sovereign nations, they are in many ways more analogous to the federal government.

They do have implicit relationships with those state and local governments, however, related to concurrent jurisdiction and shared residents, taxpayers, and electorates (that is, Tribal members living in Colorado are also residents of Colorado and the county in which they reside, conferring the same benefits of any other Coloradan). However, the State of Colorado/CDPHE and counties/LPHAs may find benefits from intergovernmental cooperation with the Southern Ute Indian Tribe and Ute Mountain Tribe, related to public health...
system transformation and, specifically, governance and delivery of CPHS.

PHNCI suggests that public health system transformation efforts engage Tribal leaders and invite them to participate in their policy efforts, as part of the governmental public health system. As sovereign governments, Tribes can decline these offers, however, their long term participation may be critical to addressing health inequities for their members and residents, making it extremely valuable.

Governmental Public Health Workforce Availability to Support Full Implementation of CPHS

Full implementation of CPHS is expected to greatly increase demand for a trained, experienced governmental public health workforce. We know, based on the barriers to full implementation reported by LPHAs, that even at the current level of implementation of CPHS, there is competition for governmental public health workforce.

The current, local public health workforce was approximately 2,110 FTE in 2018 and combined, CDPHE and LPHAs had 2,470 FTE working on CPHS in (S)FY 2018.

Together, CDPHE and LPHAs estimate a total workforce need of 5,730 FTE to fully implement CPHS and continue their current additional important service activities, suggesting a need for an additional 3,261 FTE to fully implement CPHS. This does not include any potential staffing needs related to growth in demand for CPHS over time, nor does it include any staffing needs address to local/state current and future priorities that are not CPHS. This is also assuming that transformation efforts don’t significantly change the overall relationship between staffing and service levels, though the very nature of the term “transformation” there should be some efficiencies gained over time.

Further, CDPHE and LPHAs cite recruitment challenges, turnover, and inability to fill workforce needs as a significant barrier to implementation to CPHS (and likely, their overall work).

While some of this turnover is likely due to LPHAs recruitment and turnover challenges, it is also possible that some of it stems from the politicization of LPHA directors (who serve at the pleasure of the local board of health), as well as CDPHE’s executive director (which is a governor appointed position). This is likely to lead to increased turnover in these positions, which is a significant challenge given the influence of the positions.

Governmental public health careers are an important are expected to continue to be in demand. By connecting Coloradans to these jobs, we can meet our economic development goals, ensuring all Coloradans have access to opportunities for quality, lifelong education connected to the future of work.

While the primary dataset generated as part of this Needs Assessment is not exhaustive, we certainly could use it to make assumptions about workforce needs, including analysis of particular subsets of the workforce that are likely to be most needed under implementation scenarios. This could be compared with national work like PH WINS to generate an understanding of workforce needs.

More analysis is needed to understand the whether the existing public health workforce in Colorado is sufficient to support full implementation of CPHS across the state and, further, whether that workforce is distributed across the state in such a way as to support full implementation at the LPHA level.

Identifying and Aligning Governmental Public Health Role with Responsibility for Funding

The codification of CPHS definitions in administrative rule was (at the time it was implemented by the 2008 Public Health Reauthorization Act) and continues to be to define the Colorado governmental public health system’s role in protecting the public’s health.

However, as we discussed on page 52, the State Board included language in the CPHS administrative rules to prevent CPHS from becoming an unfunded mandate, by allowing local boards of health to set priorities for
delivering CPHS based on the funding available. The misalignment between the defined role of governmental public health and the funding for that role, has created the current uneven implementation of CPHS statewide.

It’s also a significant juxtaposition: CPHS are so critical that they are required by state law to be available to everyone, everywhere in Colorado but only to the degree they are funded.

In effect, the State Board only puts a ceiling on CPHS, and other policy makers (implicitly at the federal and state level and explicitly at the local level) decide the degree to which CPHS overall should be available, or, in some cases, which CPHS (individual services) should be available. That is, federal and state level policy makers are implicitly, and local level policy makers are explicitly, based on the funding they provide for implementing CPHS, making a policy choice about which CPHS should be available in local communities, which has statewide implications as these services are needed everywhere to work anywhere.

Essentially, current funding for governmental public health is set without regard to the cost of delivering CPHS; some of these funds also fund services beyond CPHS. The total available resources are not sufficient for any LPHAs in Colorado to have enough revenue to ensure CPHS are fully implemented in their communities. Stated simply, there is not alignment between funding for CPHS and the cost of delivering CPHS. Further, because there is not alignment between who is defining CPHS and who is funding CPHS, current funders are not obligated to address this misalignment.

Addressing this misalignment requires answering an important question: who should be responsible for funding CPHS and to what degree? This is an important outstanding policy question that must be answered to support future strategy around funding mechanisms and sources.
Next Steps

The CPHS Needs Assessment is the first step in an evolving process to implement CPHS through a public health system transformation process. The Needs Assessment clearly articulates the Colorado governmental public health system’s current governance and service delivery paradigm, documents current implementation and spending on CPHS, and estimates the full cost of implementing CPHS at a planning-level. However, it does not clearly articulate how to achieve full implementation of CPHS.

Instead, it is expected that how full implementation will be achieved will be articulated as part of CALPHO and CDPHE’s roadmap for public health system transformation in Colorado.

Roadmap Development

Achieving full implementation of CPHS will require significant systemic change. To support this, it is crucial that Colorado’s governmental public health system coalesce around a roadmap for achieving it as part of their broader public health system transformation efforts. This roadmap should guide the many policy choices, both within and outside of the governmental public health system, necessary to achieve public health system transformation. It should also recognize that these decisions will be made both systemically and individually (for individual governmental public health agencies), and support flexibility in individual decision making.

Due to the complexity of this effort, we believe this roadmap should be developed as part of a broader change management effort, led by Colorado’s governmental public health system transformation stakeholders. The Colorado governmental public health system has identified the PROSCI ADKAR change management model (shown in Exhibit 48) to support initial workplanning and change management efforts.

![Exhibit 48. PROSCI ADKAR Change Management Model](image)
The PROSCI ADKAR change management model has five main stages: Awareness, Desire, Knowledge, Ability, and Reinforcement. While Colorado’s governmental public health system’s future roadmap should include all of these stages, the findings from the CPHS Needs Assessment contribute most directly to development of the overall strategy and change management plans as part of managing change.

Following, we have outlined some potential next steps for public health system transformation in Colorado, identified by the CPHS Needs Assessment. This outline is in no way final or prescriptive, but does give initial input on how the conclusions within this Needs Assessment might be used to inform transformation of Colorado’s governmental public health system.

Preparin for Change
The CPHS Needs Assessment identified several key next steps for advancing overall public health system transformation strategy, including:

- Promulgation of minimum quality standards that can be articulated to support understanding what implementation “buys” to help communicate why it’s needed to the public, policy makers, and potential funders.
- As desired, advance the CPHS definitions for conformity with the suggestions made in this Report.

- Provide additional detail to flesh out the elements and activities related to Health Equity and the Social Determinants of Health and Access to and Linkage with Health Care.
- If desired, break up the function B.2.c. Environmental Health Investigations, Inspections, Sampling, Lab Analysis, and Oversight to match the scale of other CPHS functions and allow for more detailed analysis of the disparate programs therein.
- Advance the type of service schema and generate a network analysis to better understand the relationships among services and the potential interdependencies they represent, to reduce the chance those interdependencies become barriers.
- Further explore and define these cross jurisdictional service delivery models, including, through assessment of the effectiveness of existing models. There is also a need to develop policy infrastructure to support these models. This may include development of demonstration projects to advance these models.
- Formally support ongoing, regional conversations among governmental public health agencies around opportunities to increase cross jurisdictional delivery of services.
- Advance the governmental public health system’s understanding of both the cross jurisdictional sharing and relationship interdependencies between CDPHE and LPHAs. While the Needs Assessment primary data gives us a start on this exercise, it will require additional primary research and discussion.
- As implementation of CPHS proceeds, it will be important to clarify the appropriate roles of these non-governmental public health providers, including broader state and county government, to understand their role in the success of public health system transformation.
- Continue to assess and refine cost estimates related to surge, cyclical costs, and emergency response and capital needs. The governmental public health system should also consider any potential implementation costs that may be incurred through implementation.
- Develop a uniform chart of accounts and begin longitudinal tracking (including backdated analysis) to support understanding of the existing governmental public health system funding and changes to that funding over time.

Managing Change
The managing change phase of ADKAR suggests need for five key plans. The CPHS Needs Assessment Findings provide insight into some key initiatives that should fall within some of those plans. Following, we’ve described the evidence-informed actions that the CPHS Needs Assessment suggests as part
of the Colorado governmental public health systems’ broader transformation effort.

Communication Plan
- Assess and communicate what implementation “buys” through an asset-based perspective, to help communicate why implementation of CPHS is needed to the public, policy makers, and potential funders.

Sponsor Roadmap
- Work with sponsors to review and “clean up” Title 25: Public Health and Environment to improve governmental public health agencies’ understanding of and compliance with the statute. In particular, clearly articulate CDPHE’s powers and duties and the powers and duties of the State Board relative to all other rule making and non-rule making governance bodies.
- Clarify the role of governmental agencies to whom governmental public health agencies are subordinate to articulate their roles and expected contributions as part of the advanced governmental public health system.
- Work with sponsors to increase the flexibility, predictability, security, and magnitude of funding for full implementation of CPHS, and to identify mechanisms for funding state and local priority services.

Coaching Plan
- Build a shared understanding of new CPHS framework and operational definitions among governmental public health system policy makers and staff.
- Explore opportunities to increase agency cost-recovery through fees and fines.
- Explore opportunities to coach governmental public health agencies in categorical funding spend-down to prevent reversion of funds. Generate strategies to siphon would-be reversion to other appropriate governmental public health purposes.

Resistance Management Plan
- Develop a process to support ongoing updates to the CPHS framework, as it necessarily evolves with public health practice and Colorado’s health needs.
- Support local control in decision making as a principle of the change management plan.
- Work with governmental public health agencies to identify a flexible phasing strategy for implementation of CPHS that supports LPHAs in meeting their priorities for implementation.
- CDPHE OPPI and LPHAs should work together to identify a preferred window for future Annual Report processes that meets both reporting deadlines and supports LPHA participation.

Training Plan
- Work with LPHAs on strategies for evaluating the capacity of expertise with which CPHS elements and activities they govern are delivered in their service areas, rather than just their capacity and expertise as an agency. This information should inform ongoing conversations about cross jurisdictional sharing between sharing partners.

- Where possible, encourage all LPHAs to move to modified accrual accounting systems as suggested by GASB. A modified accrual accounting system.
- There is a need for comprehensive technical assistance and validation in all LPHA reporting to CDPHE.

Integration with Broader Governmental Public Health Efforts
Because public health system transformation is an overarching initiative intended to systemically transform Colorado’s governmental public health system, this workplan should be designed to maximize integration within the broader governmental public health system context and existing initiatives, rather than be a standalone initiative.

Part of that integration is likely to be alignment and coordination with Colorado’s 2020-2024 Statewide Public Health Improvement Plan, as well as with local community health improvement plans that will be developed over the next five years as part of the cyclical CHAPs process.
ASSSESSMENT RESPONDENTS

This Core Public Health Services Needs Assessment was made possible by the participation of Colorado’s 54 governmental public health agencies, including the Colorado Department of Public Health and Environment (CDPHE) and 53 local public health agencies, as well as close governmental partners Denver Public Health and Northwest Colorado Health.

In all, over 259 LPHA and CDPHE staff are known to have directly participated in the Needs Assessment Data Collection process; if we were to consider all of the people within LPHAs who answered questions or provided data for this purpose, that number might be much higher. These staff worked tirelessly within their already constrained capacity and schedules, to provide detailed agency-level data to inform this needs assessment. More information about participating governmental public health agencies’ efforts related to this needs assessment is available in Appendix C: Data Collection and Validation Process Methodology.

We are deeply grateful to everyone who participated in the Needs Assessment data collection process.

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Assessment Tool Beta Testers and Technical Assistance Support

The individuals to the left participated in the Needs Assessment Data Collection and Validation process other than as respondents.

Some of these individuals (Assessment Tool Beta Testers) provided invaluable review and comment to help us advance our Assessment Tool before it was used by respondents.

Other individuals (Assessment Additional Support and Technical Assistance) provided additional technical assistance to respondents, to augment our efforts. These individual work within Colorado’s governmental public health system, and brought important knowledge and understanding to their technical assistance efforts, beyond what a contractor could ever offer.

Both of these groups contributions were invaluable to the CPHS Needs Assessment. We are deeply grateful to everyone who participated in Needs Assessment Tool development and technical assistance throughout this process.
APPENDIX B

CPHS Operational Definitions: Function Code Key

A. FOUNDATIONAL CAPABILITIES

1. Assessment and Planning
   a. Data Collection and Distribution
   b. Data Access, Analysis and Interpretation
   c. Health Assessment Development, Implementation and Evaluation
   d. Vital Records
   e. Public Health Laboratory (State and Regional Lab Role Only)

2. Communications
   a. Media Communications
   b. Public Communications
   c. Internal and Partner Communications

3. Policy Development and Support
   a. Policy Development
   b. Policy Enactment
   c. Policy Evaluation

4. Partnerships
   d. Partner and Community Relationships

5. Organizational Competencies
   a. Accountability, Performance Management and Quality Improvement
   b. Human Resources
   c. Legal Services and Analysis
   d. Financial Management, Contract and Procurement Services, and Facilities Management
   e. Information Technology/Informatics (IT)
   f. Leadership and Governance

Source: Habile, 2019.
6. Emergency Preparedness and Response
   a. Public Health Preparedness and Response Strategies and Plans
   b. Emergency Support Function 8
   c. Emergency Response
   d. Community Preparedness

7. Health Equity and Social Determinants of Health
   a. Leadership and Workforce Training and Diversity
   b. Health Equity Policy
   c. Health Equity Data
   d. Health Equity Partnerships
   e. Health Equity Communications

B. FOUNDATIONAL SERVICES

1. Communicable Disease Prevention, Investigation and Control
   a. Communicable Disease Prevention
   b. Identify Communicable Disease Prevention, Investigation and Control Assets
   c. Communicable Disease Investigation and Control
   d. Immunization
   e. Coordination of Other Communicable Disease Services with Foundational Capabilities and Services

2. Environmental Public Health
   a. Environmental Health Data
   b. Identify Environmental Health Assets
   c. Environmental Health Investigations, Inspections, Sampling, Lab Analysis and Oversight
   d. Zoonotic Conditions
   e. Land Use Planning and Climate Change
   f. Coordination of Other Environmental Health Services with Foundational Capabilities and Services

3. Maternal, Child, Adolescent, and Family Health
   a. Maternal, Child, Adolescent and Family Health Information
   b. Identify Maternal, Child, Adolescent and Family Health Assets
   c. Collaborative Efforts around Maternal, Child, Adolescent, and Family Health
   d. Maternal, Child, Adolescent and Family Health Improvement
   e. Mandated Newborn Screening (State Role Only)
   f. Coordination of Other Maternal, Child, Adolescent and Family Health Services with Foundational Capabilities and Services

4. Chronic Disease, Injury Prevention, and Behavioral Health Promotion
   a. Chronic Disease, Injury Prevention, and Behavioral Health Promotion Data
   b. Chronic Disease, Injury Prevention and Behavioral Health Promotion Assets
   c. Chronic Disease, Injury Prevention and Behavioral Health Promotion Policies
   d. Coordination of Other Chronic Disease, Injury Prevention, and Behavioral Health Promotion Services with Foundational Capabilities and Services

5. Access to and Linkage with Health Care
   a. Collaborative Efforts Around Access to Clinical Care
   b. Access to Clinical Care Data
   c. Health Facility Inspection and Licensure (State Role Only)
   d. Linkage to Clinical Care
APPENDIX C

Acronyms/Abbreviations and Glossary

Acronyms/Abbreviations

- **24/7 Access**: Twenty-four/seven access
- **AAR**: After Action Reports
- **ACE**: Adverse Childhood Events
- **BRFSS**: Behavioral Risk Factor Surveillance System
- **CALBOH**: Colorado Association of Local Boards of Health
- **CALPHO**: Colorado Association of Local Public Health Officials
- **CBO**: Community-based Organizations
- **CCHD**: Critical Congenital Heart Disease
- **CCR**: Code of Colorado Regulations
- **CDC**: Centers for Disease Control and Prevention
- **CDEH**: Colorado Directors of Environmental Health
- **CDPHE**: Colorado Department of Public Health and Environment
- **CEHA**: Colorado Environmental Health Association
- **CEMP**: Comprehensive Emergency Management Program
- **CHA**: Community Health Assessment
- **CHAPS**: Colorado Health Assessment and Planning System
- **CHIP**: Community Health Improvement Plan
- **CLAS**: Culturally and Linguistically Appropriate Services, as defined by the United States Department of Health and Human Services, Office of Minority Health standards
- **C-MIST**: Communications, Medical Care, Independence, Self Determination and Safety Support Services, and Transportation
- **COOP**: Continuity of Operations Plan
- **CoPHAD**: Colorado Public Health Administrators
- **COSOPHE**: Colorado Society for Public Health Education
- **CPHA**: Colorado Public Health Association
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>CPHNL</td>
<td>Colorado Public Health Nursing Leaders</td>
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<tr>
<td>CPHS</td>
<td>Core Public Health Services</td>
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<tr>
<td>CRS</td>
<td>Colorado Revised Statutes</td>
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<tr>
<td>EOC</td>
<td>Emergency Operations Center</td>
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<tr>
<td>EPA</td>
<td>United States Environmental Protection Agency</td>
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<tr>
<td>ESF8</td>
<td>Emergency Support Function 8 - Public Health &amp; Medical</td>
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<tr>
<td>FDA</td>
<td>United States Food and Drug Administration</td>
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<tr>
<td>FPHS</td>
<td>Foundational Public Health Services</td>
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<tr>
<td>FTE</td>
<td>Full Time Equivalents</td>
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<tr>
<td>FY</td>
<td>Fiscal Year</td>
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<tr>
<td>GAAP</td>
<td>Generally Accepted Accounting Principles</td>
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<tr>
<td>GASB</td>
<td>Governmental Accounting Standards Board</td>
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<tr>
<td>GFOA</td>
<td>Government Finance Officers Association</td>
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<tr>
<td>GIS</td>
<td>Geographic Information System</td>
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<tr>
<td>HHS</td>
<td>United States Department of Health and Human Services</td>
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<td>HIPPA</td>
<td>Health Insurance Portability and Accountability Act</td>
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<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
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<tr>
<td>HKCS</td>
<td>Healthy Kids Colorado Survey</td>
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<tr>
<td>ICS</td>
<td>Incident Command System</td>
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<tr>
<td>IIS</td>
<td>Immunization Information System</td>
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<tr>
<td>IOM</td>
<td>Institute of Medicine</td>
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<tr>
<td>IT</td>
<td>Information Technology</td>
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<tr>
<td>LPHA</td>
<td>Local Public Health Agency</td>
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<tr>
<td>LRN</td>
<td>Laboratory Response Network</td>
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<tr>
<td>LRN-B</td>
<td>Biological Reference Laboratory</td>
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<tr>
<td>LRN-C</td>
<td>Chemical Reference Library</td>
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<tr>
<td>MOU</td>
<td>Memorandum of Understanding</td>
</tr>
<tr>
<td>NASEM</td>
<td>National Academies of Science, Engineering, and Medicine</td>
</tr>
<tr>
<td>OMB</td>
<td>United States Office of Management and Budget</td>
</tr>
<tr>
<td>OPPI</td>
<td>Colorado Department of Public Health and Environment Office of Partnerships, Planning, and Improvement</td>
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</tbody>
</table>
PHAB  Public Health Accreditation Board
PHIP  Public Health Improvement Plan
PHLF  Public Health Leadership Forum
PHNAC Public Health Nurses Association of Colorado
PHNCI Public Health National Center for Innovations
SFY  State Fiscal Year
SDOH  Social Determinants of Health
State Board State Board of Health
TABOR Taxpayer Bill of Rights
TB  Tuberculosis
US  United States of America
USDA United States Department of Agriculture
WCAEHO Western Colorado Association of Environmental Health Officers
Glossary

**24/7 Access:** Each governmental public health authority as well as a few specific CDPHE programs must be reachable by phone 24/7 for urgent or emergency issues. It is expected that use of the 24/7 agency or program contact numbers will reach, within 15 minutes, a knowledgeable public health professional capable of assessing an event or urgent public health consequence and initiating an appropriate response.

**Ability to:** Capacity and expertise to implement an activity, element, function and/or foundational capability or service, as needed.

**Accrual Basis Accounting:** An accounting method that recognizes expenses when they are incurred regardless of the payment status of the charges, and records revenue when a legal obligation is created.

**Activities:** The discreet (defining only one action per statement) public health work described by operational definitions.

**Additional Increment of Foundational Capabilities Attributable to State and local priority services:** An additional share of foundational capabilities needed to fully implement state and local priority services.

**Assure:** The dictionary definitions implies the removal of doubt and suspense from a person’s mind. In the context of Colorado’s CPHS definitions, this means that it is foundational for the governmental public health system to invest time and resources as needed to make sure that the service is available to the community, generally as provided by partner organizations. The service may already be provided by a partner organization or governmental public health may coordinate with partners to get them to provide the service. If no other organization is willing or able to provide the service, governmental public health may decide to become the provider of the services and seek the necessary funds for the service.

**Additional Increment of Cost:** The difference between the resources currently supporting existing CPHS activities and the amount of resources needed to support full implementation of CPHS activities.

**Capacity to:** Staff or other labor resources with the ability and associated materials and supplies to provide the activity, element, function and/or foundational capability or service.

**Capital Costs:** An expenditure to acquire or improve fixed assets, which typically consists of tangible property, equipment or, in some cases, supplies that have a useful life of more than a year.

**Cash Basis Accounting:** An accounting method that recognizes transactions when there is an exchange of cash, such that expenses are not recognized until they are paid and revenue is not recognized until payment has been received.

**Uniform Chart of Accounts:** The uniform set of formal definitions and labels for each type of revenue and expense that might be incurred by agencies within a specific system. For example, a uniform chart of accounts for the governmental public health system would include a uniform set of formal definitions and labels for each type of revenue and expense that might be incurred by governmental public health agencies.

**Colorado Governmental Public Health System:** Governed by the State Board of Health (State Board), and which includes the Colorado Department of Public Health and Environment (CDPHE) and 53 local public health agencies (LPHAs), each respectively governed by their own Board of Health (in many cases, where LPHAs are single-county agencies serving populations fewer than 100,000 Coloradans, their Board of County Commissioners).
Core Public Health Services (CPHS): Colorado’s framework for describing the limited statewide set of core public health services that include foundational capabilities and services that (1) must be available to all people in Colorado, and (2) meet one or more of the following criteria:

- Services that are mandated by federal or state laws.
- Services for which the governmental public health system is the only or primary provider of the service, statewide.
- Population-based services (versus individual services) that are focused on disease prevention and protection and promotion of health.

Cross-jurisdictional sharing: The deliberate exercise of public authority to realign service delivery to new jurisdictional boundaries and solve problems that cannot be easily solved by existing jurisdictions[1].

Current Spending: The amount of resources supporting the current delivery of CPHS.

Definition: Definitional components that organize the different activities (described by operational definitions) of CPHS to detail the work being done. In some cases where a definition is discreet (defining only one action per statement) it will not organize activities, and will instead standalone in detailing the work to be done.

Direct Health Care Services. Health care services that are directly provided to individuals.

District LPHAs: A type of local public health agency that delivers regionalized services to multiple counties as one. District LPHAs are governed by a district board of health with at least five members appointed by an appointments committee composed of one member of each of the boards of county commissioners of the counties served by the district. Each participating county should be represented by at least one member of the board of health.

Economies of Scale: The proportionate cost savings per unit gained through an increase in production.

Element: The public health work described by definitions.

Emergency Support Function (ESF8) Public Health and Medical Services Annex: Provides the mechanism for coordinated federal assistance to supplement local, state, and Tribal Nations’ resources in response to a public health and medical disaster, potential or actual incidents requiring a coordinated federal response, and/or during a developing potential health and medical emergency.

Enabling Services. Services that help families access and use direct health care services, and are usually targeted to families that have special needs or face barriers to accessing services.

Ensure: The dictionary definition implies a virtual guarantee. In the context of Colorado’s CPHS definitions, this means that the governmental public health system provides the service to the community.

Expertise: The appropriate knowledge and skills necessary to provide the activity, element and/or foundational capability or program.


Fixed Costs: Costs that do not vary as a function of the quantity (number of units) of service provided.

Foundational Capabilities: The crosscutting capacity and expertise needed to support public health programs.

Foundational Services: The subset of services in each public health program area that are defined as foundational.
Foundational Public Health Services (FPHS): A national framework for describing the limited statewide set of core public health services that include foundational capabilities and programs that (1) must be available to all people served by the governmental public health system, and (2) meet one or more of the following criteria:

- Services that are mandated by federal or state laws.
- Services for which the governmental public health system is the only or primary provider of the service, statewide.
- Population-based services (versus individual services) that are focused on disease prevention and protection and promotion of health.

Full Implementation: Implementation of CPHS such that every Coloradan lives in a service area where CPHS are delivered with the full capacity and expertise needed.

Full Time Equivalents (FTE): An unit that indicates the workload of staff, where one FTE is equivalent to working 2,080 hours in given year.

Function: Definitional components that organize the different elements (described by definitions) and activities (described by operational definitions) of CPHS to detail the work being done.

Infrastructure-building Services: Services that lay the foundation for policies and programs that improve health and wellbeing.

In-kind: The estimated value of any goods, services, or transactions that you receive for free and use or “spend” on governmental public health activities.

Labor Costs: The salaries and benefits of staff implementing governmental public health activities.

Likert Scale: An ordinal rating scale, often found in surveys, to assess respondent perception around a qualitative topic.

Modified Accrual Basis Accounting: An accounting method where revenues are recognized as they become available and measurable and, with a few exceptions, records expenditures when liabilities are incurred.

Operating Costs: The costs of day-to-day activities, including all related consumable items such as materials/supplies, small equipment, professional services, and other contracted services.

Operational Definitions: Definitions that describe “what” CPHS provides for Colorado’s communities, but not “how” governmental public health should provide it,

- Are agnostic to which governmental public health provider should provide it,
- Are reduced to discreet activities (define as few actions as possible per statement) and begin with a verb identifying the action to be taken, and
- Align with existing guidelines and regulations.

A singular operational definition describes a single public health activity.

Overhead Services. Services that allow for governmental public health agency operation, but have no direct community benefit (e.g., financial management, human resources).

Population-based Services. Health and environmental risk prevention, health promotion, and health and environmental protection activities which provide an indirect benefit to a community or population.

Public Health: The prevention of injury, disease and premature mortality; the promotion of health in the community; and the response to public and environmental health needs and emergencies and is accomplished through the provision of essential public health services\[1\].
Public Health Accreditation Standards: A set of standards defined by the Public Health Accreditation Board (PHAB) to support assessment of the quality and performance of all public health agencies in the United States. Agencies that meet these standards through a vetting process with PHAB can become accredited.

Public Health System: All public, private, and voluntary entities that contribute to the delivery of essential public health services within a jurisdiction. These systems are a network of entities with differing roles, relationships, and interactions that contribute to the health and well-being of the community or state.

Reportable Conditions: Selected diseases and conditions for which Colorado health care providers, health care facilities, laboratories, veterinarians, food service establishments, child day care facilities and schools are legally required to notify local public health agencies of suspected or confirmed cases. The full current list of reportable conditions is available here: https://www.colorado.gov/pacific/cdphe/communicable-disease-manual.

Single County LPHAs: A type of local public health agency that delivers local governmental public health services to a single county. In a county with a population less than 100,000 single county LPHAs may be governed by either the board of county commissioners or a separate board of health with at least three members appointed by the board of county commissioners.

Single County LPHAs with Contractual Arrangements to Provide Services: Deliver regionalized services to multiple counties, with each county retaining governance authority.

Single County LPHA subordinate to County Health and Human Services Department: A type of local public health agency that delivers local services to a single county, as part of the activities of the county’s broader Health and Human Services department. In a county with a population less than 100,000 single county LPHAs may be governed by either the board of county commissioners or a separate board of health with at least three members appointed by the board of county commissioners.

Single County LPHA coordinating with a Quasi-governmental Agency: A type of local public health agency that delivers local services in a single county, in cooperation with a Quasi-governmental agency. In a county with a population less than 100,000 single county LPHAs may be governed by either the board of county commissioners or a separate board of health with at least three members appointed by the board of county commissioners.

State and local priority services: Public health services that are not CPHS but may be delivered by governmental public health agencies. These services are not needed everywhere to work anywhere (although, in some cases, they may be needed everywhere) and often include individualized interventions that are not state- or federal-mandated or services that are not the role of governmental public health or for which there are other appropriate providers beyond governmental public health.


Surge Capacity: The staffing and resources necessary to provide the activity, element, function and/or foundational capability or program in response to emergencies or other irregular events that lead to increased demand for CPHS.

Unit Cost: The share of full costs that are attributable to one unit of service.

Variable Costs: Costs that vary as a function of the quantity (number of units) of service provided.
APPENDIX D:

Needs Assessment Data Collection and Validation Process and Methodology

Assumptions
Scope and Participation

This CPHS Needs Assessment had two key purposes:

1. Understand current statewide implementation and spending on core public health services.

2. Estimate the cost to fully deliver core public health services statewide based on the current service delivery paradigm.

Additionally, it was intended that the Needs Assessment be designed to naturally connect to and support the robust public health system transformation planning process already being undertaken in Colorado, which meant that the needs identified should be defined in the context of the existing governmental public health system, made up of CDPHE and 53 LPHAs, based on the existing service paradigm. Further, the Needs Assessment also should consider related policy around topics like governance, service delivery, and funding.

We identified that to accomplish this effectively, we would need to collect primary data from all 54 disparate governmental public health agencies (CDPHE and all 53 LPHAs) as we believed each agency had important local knowledge, that only they could contribute about both the current and future state of governmental public health system and CPHS implementation, including:

Questions to assess the current state of the system:
- Current sharing in delivery of CPHS
- Self-assessment of the capacity and expertise to deliver CPHS in jurisdiction served
- Current spending on CPHS
- Service access and barriers to services access for direct and indirect services
- Identification of services for which fees are charged

Questions around needs related to full implementation:
- Interest in and willingness to share CPHS services in the future
- Non-financial barriers to full implementation
- Estimate of the full cost of implementation

Collecting this data from all 54 governmental public health agencies in Colorado was an ambitious goal; a successful data collection strategy for accomplishing it would both complex and time-consuming for already resource-constrained governmental public health agencies. To support this, CDPHE’s OPPI elected to combine this process with their 2019 Annual Report, a mandatory process that collects data on LPHAs activities for the prior fiscal year. Completion of the Annual Report is a prerequisite to receiving OPPI local planning and support funds, so it is, in a sense, mandatory for LPHAs.

Recognizing that this was a unique one-time opportunity to collect both a breadth and depth of data from all 54 governmental public health agencies, significant effort was made to design and facilitate a data collection process that would yield a high-quality, validated primary dataset on which to base the overall Needs Assessment.

To do that, the CPHS Needs Assessment data collection process needed to:
- Engage CDPHE and all 53 LPHAs in the data collection process to collect as much
primary data as possible.
- Build a shared understanding of the refined CPHS framework and definitions.
- Collect data through targeted questions around the project purpose (i.e., current implementation and spending on the and the full cost of implementation of CPHS) and related policy (e.g., governance, service delivery, funding, etc.).
- Validate collected data and, if necessary, fill information gaps.
- Connect to Colorado’s broader public health system transformation efforts and leverage the data collection process to assist with other ongoing project components.

Following, we describe the methodology of the assessment data collection and validation process designed to achieve to meet these needs.

Programmatic Framework

Colorado’s CPHS Operational Definitions were the programmatic framework for the Needs Assessment, and thus, necessarily the programmatic framework for the Needs Assessment Data Collection process.

What this means, is that the Needs Assessment questions were all asked specifically to individual definitions, at varying levels from function down to activity. For the purposes of the Assessment Data Collection process, we used the final draft version of these definitions, as published in the Core Public Health Services Operational Definitions Manual, dated May 2019.

We intentionally used “final draft” operational definitions as the programmatic framework, rather than finalizing them ahead of the Needs Assessment data collection process, as we expected that the process would provide a valuable opportunity to refine the definitions.

While most of the definitions were reinforced by the Needs Assessment data collection process, Assessment respondents agreed that the two functions related to laboratory services (a general function within Assessment and Planning and a communicable disease-specific on in Communicable Disease Prevention, Investigation, and Control) was duplicative and that the definitions should be combined into one function, in Assessment and Planning.

Use of these operational definitions did present some challenges. First, the (final) framework, is extremely detailed, including 7 foundational capabilities and 5 foundational services; 52 functions; 114 elements, and 343 activities. (The final draft framework included 7 foundational capabilities and 5 foundational services; 53 functions; 114 elements, and 346 activities.)

Obviously, it is impractical to ask a large number of questions or any questions that are time-intensive to respond to, at such a detailed level. Second, the operational definitions are extremely complex, as they nest, such that the activities are assigned to the elements on a one-to-one basis, the elements are assigned to the functions on a one-to-one basis; and the functions are assigned to the foundational capabilities and services on a one-to-one basis.

While intuitively, it may seem like the activities should “add up” to the elements, one of the challenges is that “the whole [element] may be greater than the sum of its parts [activities].” This is a greater concern at the extremely detailed element and activity level, because the narrow nature of those definitions leaves more room for gaps in the definitions due to intangible things that governmental public health agencies may be doing.

More information about the Needs Assessment’s programmatic framework and the CPHS Operational Definitions are provided in Core Public Health Services Needs Assessment Development, Assumptions, Programmatic Framework section of the Overall Report.

Time Period

The Needs Assessment was intended to generate a point-in-time estimate of current spending on CPHS for the most recently available one-year period, fiscal year 2018, and the full, annual cost of delivering CPHS in today’s (2019) dollars. Because governmental public health agencies were estimating the full cost of implementation in 2019, we assumed that their estimates were in 2019 dollars.
The 56 governmental public health agencies who provided data as part of this Assessment operate on two different fiscal schedules, with the state public health agency operating on a state fiscal year schedule (July 1 to June 30) and the 53 local public health agencies, as well as Denver Public Health and NWCH, operating on a calendar year schedule (January 1 to December 31).

Generally, it is extremely difficult for agencies to report on periods that are different than their fiscal schedules, because all of their accounting is done on their fiscal schedule, meaning that all of their reports are for that fiscal schedule. Recognizing this, we elected to have participating governmental public health agencies respond with the most current data available based on their own fiscal schedule.

At the time of the Needs Assessment Data Collection process, SFY 2017 (July 1, 2017 to June 30, 2018) was the last full year for which CDPHE data was available and FY 2018 (January to December 2018) was the last full year for which LPHA data was available. These periods are different by six months, and we did not collect data from CDPHE for June to December 2018, as shown in Exhibit B-1.

However, as Exhibit B - 1 shows, we still collected data for CDPHE for June to December, just for a different year (2017). We assumed that these periods (June to December 2017 and June to December 2018) would be substantively similar enough that we would not need to reconcile the data further, however, we do acknowledge some limitations to this approach, in the limitations section.

In addition, there are five other factors that need to be considered related to the nature of this data as a point in time estimate.

The different accounting methods used by the 56 governmental public health agency respondents. While most of our respondents use a modified accrual basis approach as suggested by GASB, some use a cash or accrual basis, instead. Modified accrual accounting is the preferred method for ideal for reporting or analyses, such as this Needs Assessment, since it focuses on current-year obligations, reporting whether current-year revenues are sufficient to meet current-year obligations. What this means, is that, using information from generated using either a cash-basis-or an accrual-basis accounting method might result in understated or overstated expenses and revenues for these agencies relative to the modified accrual method.

Since the goal of this assessment is to generate a statewide estimate of the current spending on and the resources for full implementation of CPHS, the potential for minor discrepancies based on accounting method are expected to be immaterial.

Also, the agency-level results of this analysis will be true to agencies experience since it will align with the basis on which they report.

The second is the potential for organizational

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**Exhibit B - 1. Needs Assessment Data Periods**

<table>
<thead>
<tr>
<th>CDPHE</th>
<th>53 LPHAS</th>
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<tbody>
<tr>
<td>SFY 2018, July 1, 2017 to June 30, 2018</td>
<td>SFY 2019, July 1, 2018 to June 30, 2019</td>
</tr>
</tbody>
</table>

**ASSESSMENT PERIOD**

FY 2018, January to December 2018

<table>
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<tr>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
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</table>

Source: Habile, 2019.
change to impact the reliability of CDPHE’s SFY 2018 and LPHAs FY 2018 revenues and current spending as a representation of normal, annual costs for current CPHS activities.

To address this potential, as part of the 2019 Annual Report, we asked agencies whether their agencies had faced any changes in the previous year which may have had a positive or negative impact on their operations (e.g., related to workforce, politics, community perception, etc.).

Where they had, we asked agencies to describe the perceived impact. Agencies identified several changes that had impacted them in 2018; in most cases, we felt that these issues were within the range of normal variation for any given year. We have documented the changes described by LPHAs below for posterity:

- Workforce changes, including major retirements in many LPHAs
- Changes in county leadership and administration in several LPHAs
- Technological changes, like implementation of new enterprise systems, in several counties and their LPHAs
- Introduction of new public health programs (through new grants and contracts) in a few LPHAs
- Significant organizational restructures in a few LPHAs
- Reversion of responsibility for consumer protection inspections to CDPHE from a couple of LPHAs
- Achievement of accreditation by one LPHA
- A major revenue reduction to one LPHA
- A major fire that required a public health emergency response in one community
- A major hepatitis A outbreak that required surge capacity to address in one community

However, in one case, we identified that the change was significant enough to merit special consideration in the data collection process: three LPHAs Moffat, Routt, and Jackson County Public Health Agencies, who had been previously delegated the majority of their LPHAs services to a nonprofit (Northwest Colorado Health) have begun a process to more directly manage their LPHA responsibilities.

This is likely to entail a continued relationship with Northwest Colorado Health for some services, but also more direct governance and delivery of governmental public health services by the LPHA. We addressed this by having these agencies provide updated self-assessment scores based on their perceived capacity and expertise for delivering CPHS based on their new paradigm (rather than the previous paradigm, delegation of services through the nonprofit).

The third is the annual variability in services related to surge and emergency response demands. This Needs Assessment attempts to generate a statewide understanding of the normal, annual costs of fully implementing CPHS. These normal costs include some level of “typical” surge capacity, however, it does not include costs related to greater than average annual surge or emergencies (surge or emergencies beyond what governmental public health agencies are instructed to have resources for per the CPHS Operational Definitions).

Since governmental public health is engaged in work that must respond to demand surges that are outside of the system’s control, it is possible that there are surge and emergency costs beyond what might be considered “typical”, in the annual cost data collected during the Assessment, which could reflect actual surge and emergency response costs that were higher in SFY and FY 2018 than would typically be expected.

It is also possible that there are surge and emergency costs beyond what would appear in our normal, annual costs that should be included in our final cost estimates that are not captured by the data collected from governmental public health agencies.

Fourth, there is a certain amount of variability associated with cyclical services and other factors that can cause unusual variation in services from year to year. For example, CHAPS planning occurs on an eight phase planning cycle, whereby LPHAs must conduct a community health assessment (CHA) and capacity assessment before engaging in the prioritization process and development and community health improvement plan (CHIP).
In many cases, development of the CHA might take upwards of a year before CHIP development, which might take another year. After those two extremely labor intensive activities would come a period of implementation, promotion, and monitoring of the CHIP, which, by comparison may seem less intensive.

The difference in activities and the perceived difference in the intensity of those activities may lead one to believe that there is significant variation in services from year to year. This may be the case among CPHS functions, elements, and activities, but is unlikely to be the case overall (or even at the foundational capability and service level). This is because governmental public health agencies largely have professional workforces that remain static (beyond increases due to change in demand and turnover) from year to year. So while there may be minor variation in activities from year to year, the financial need is likely to be the same.

Lastly, is the impact of capital expenditures which can fluctuate dramatically based on capacity and/or condition of current facilities and equipment.

Since different agencies are likely to be in different places on their facility and equipment aging curves, it was assumed that (S)FY 2018 would capture a reasonable “annualized” picture of capital expenditures across the statewide system.

### Methodology

The Needs Assessment Data Collection and Validation Process was a component of the overall CPHS Needs Assessment project, focused on generating a primary dataset around the current implementation and spending on and estimated full cost of implementing CPHS in Colorado, and to support implementation of CPHS there.

### Assessment Tool Development

To standardize the assessment process and support the 55 disparate governmental public health agencies responding to the Needs Assessment in providing consistent qualitative and financial data, Habile worked with the Project Management Team and a small group of beta testers to develop a standardized data collection tool, hereafter referred to as the “Assessment Tool.” The Assessment Tool was the vehicle for collecting the primary data desired to inform the CPHS Needs Assessment, and, to a lesser extent, the 2019 Annual Report to CDPHE OPPI.

Through a series of bimonthly meetings, the Project Management Team helped to develop the level of detail of the Assessment Tool, balancing level of detail with governmental public health agencies’ ability, capacity, and time to complete it. The Project Management Team, with heavy influence from CDPHE OPPI, also provided significant input into the final 2019 Annual Report questions.

### Beta Testing

As part of the Assessment Tool development process, we worked with beta testers to assess and advance a draft Assessment Tool. The Project Management Team asked the CALPHO Public Health System Transformation Committee and Public Health System Transformation Steering Committee to identify volunteers from among their membership and organizations to be beta testers and provide input into the content, usability, and design of the Assessment Tool. Input was gathered through a small group process over two meetings in a (remote) focus group/workshop setting.

Beta test participants were not asked to complete the beta Assessment Tool, but rather to comment on its content and usability, and offer their opinions regarding potential challenges for governmental public health agencies’ ability to respond. The best test occurred in two stages:

1. First, Habile hosted several one-hour orientations where we reviewed the Assessment Tool structure and the process for collecting programmatic self-assessment of current implementation, current spending, and full implementation cost (and all other) data for one foundational service or capability. As part of this meeting, participants were provided access to a “beta” Assessment Tool, via the hosted SharePoint site (discussed following), so that they could
2. Second, Habile hosted one-hour interview and focus groups with individuals or subsets of the beta testers. During these meetings, beta testers were asked to provide their valuable feedback on the Assessment Tool, including which content and features they believed worked well and which needed to be improved.

Habile made every effort to integrate the feedback received during this beta testing into the final Assessment Tool, while staying true to the Needs Assessment’s purpose.

Assessment Tool

The final Assessment Tool was developed as a Microsoft Excel workbook, specifically for the Excel Online platform, to provide a consistent response vehicle while also allowing users to access and complete the Assessment Tool on their own schedule and with multiple users, starting and stopping as desired without losing work, during the data collection period.

The Assessment Tool was designed to be as intuitive for the user as possible, using formulas, conditional formatting, and other checks and queues to support respondents ability to accurately and completely respond.

Habile staff have extensive experience designing Assessment Tools that emphasize usability, with clear wayfinding and a level of detail appropriate for all respondents, regardless of financial literacy. This was especially important in Colorado, as the participating governmental public health agencies, and thus their respondents, varied significantly.

The Assessment Tool had 16 tabs, of which 13 were data collection tabs, as shown in Exhibit B - 2.

**Instructions Tab**

The Instructions tab provided high-level instructions for completing the CPHS Needs Assessment. It also provided a link to the technical assistance materials and contact information for Habile, to request additional, one-on-one technical assistance. The instructions tab also indicated which agency’s Assessment Tool it was, as well as the Assessment point-of-contact for that agency.
CPHS Framework Tab

The CPHS Framework tab provided the full CPHS Operational Definitions in a searchable format in Excel, to allow respondents to reference the full definitions as they worked through the Assessment Tool. Because there is significant interplay among the foundational capabilities and services, respondents needed to be familiar with the full operational definitions manual, and not simply the definitions specific to the questions they tasked with responding to.

2019 Annual Report Tab

The 2019 Annual Report tab was the only tab that collected data beyond the scope of the CPHS Needs Assessment, although some of that data was incorporated into the CPHS Needs Assessment analysis. The 2019 Annual Report asked approximately (depending on how you count multi-part questions) 27 questions, listed following:

Administration

1. Total spending in FY 2018?
2. How many total FTE did your agency employ in FY 2018?
3. Agencywide beginning fund balance in FY 2018?
4. Agencywide ending fund balance in FY 2018?
5. Does your agency have a dedicated Public Health Fund in place through the County Treasury? (multiple choice; possible responses included: “yes” or “no”)
6. If yes, who manages the Public Health Fund? (multiple choice; possible responses included: “LPHA director”, “financial manager (internal)”; “finance officer at county”; “county treasurer”; or “other”)
7. When will you complete your next Community Health Assessment?
8. What is the lifecycle of you Community Health Improvement Plan?
9. Is your agency pursuing PHAB Accreditation? If your agency is not pursuing Accreditation, or is unsure of whether it’s pursuing Accreditation, please describe why?
10. If you participate in cross jurisdictional sharing relationships with other public health agencies, please list the agencies and briefly describe the sharing arrangement.

Revenues

10. Please provide your agency’s total FY 2018 revenues by source.
11. Are any of the revenue sources above (or sources within those categories) insecure (i.e., this funding may become unavailable in the next one to three years)? If so, please name the source(s) and describe.
12. Are any of the revenue sources above (or sources within those categories) unpredictable (i.e., you cannot plan on this funding from year to year because you don’t know whether/when/if it will be disbursed? If so, please name the source(s) and describe.
13. With as much granularity as possible, please provide your agencies’ total FY 2018 fees and fines by source/program/service.
14. Based on the information above (total revenues from County Sources), your county allocated $x* per capita to public health in FY 2018. Please describe the sources of those funds (e.g., general fund appropriation, mill levy, in-kind contributions, etc.).

Maternal and Child Health (MCH) Funds

15. Does your agency have Maternal and Child Health funds integrated into your Local Planning and Support contract?
16. What percentage of your total Maternal and Child Health funds support the following populations and/or efforts? (only asked if agencies responded “yes” to question 15)
17. If you selected strategies to improve the health of children and youth with special health care needs, what percentage of the funds are focused on each of the following? (only asked if agencies responded “yes” to question 15, and indicated that a share of their Maternal and Child Health funds support strategies to improve the health of children and youth with special healthcare needs)

18. Additional comments related to Maternal and Child Health funds, as needed. (only asked if agencies responded “yes” to question 15)

Environmental Public Health

19. Do you deliver traditionally-governmental environmental public health services in your community? (multiple choice; possible responses included: “yes, all”; “yes, some”; “no, on an information and complaint basis only”; and “no, none.”)

20. If others provide traditionally-governmental environmental public health services in your community, please name them and describe the services they provide.

21. Please describe the radon services you provide in your community. If you do not provide radon services in your community but other agencies/organizations do, please name them.

22. Please describe the waste tire-related services you provide in your community. If you do not provide waste tire-related services in your community but other agencies/organizations do, please name them.

Narrative

23. Please share any significant agency successes from the past year. Where possible, please provide links to relevant supporting materials.

24. Has your agency faced any changes in the previous year which may have had a positive or negative impact on your operations (e.g., workforce, politically, community perception, etc.)? If so, please describe, including the perceived impact.

25. What non-financial barriers (e.g., political will, workforce, information, etc.) do you face in addressing public health and/or environmental health issues in your agency or jurisdiction? If so, please describe, including any potential solutions for addressing the barrier if available.

26. Are there any specific resources or additional capacity that CDPHE could provide to support your agency in delivering public health services in your community?

Sign-off

27. Do you certify that this “2019 Annual Report” tab is complete and the results accurate to the best of your knowledge?

Foundational Capability and Service Tabs (12 in tabs)

The other 12 data collection tabs collected the true CPHS Needs Assessment data; there was one data collection tab for each Foundational Capability and Service. Within each Foundational and Capability data collection tab were individual data collection modules for each function of that Foundational Capability and Service. The CPHS Needs Assessment questions were organized within each of these modules. These modules included questions about both current and future state, however, for ease of review in this Report, we have split the module into two exhibits; Exhibit B - 3 shows the portion of the module that includes current state question and Exhibit B - 5 shows the portion of the module that includes future state questions. Both exhibits show how the definitions were related to the questions (item 1 in both exhibits).

Because the function definitions nest (that is, the functions [denoted by lower case letters] are further defined by the definitions [denoted by uppercase Roman numerals] under it; and the definitions are, in turn, further defined by all the operational definitions [denoted by lowercase Roman numerals] listed under it), not every question was asked nor a response expected for every
definition or even definitional component. This is explored, by question type, following.

**CPHS Needs Assessment Current State Questions**

### Current Sharing

We asked three questions designed to help us understand the nuances of the existing service delivery paradigm:

- **Do you share this function, element, or activity with another governmental public health agency?** *(multiple choice; potential responses included: “no”; “yes; another agency partially delivers this service in my jurisdiction”; “yes; another agency completely delivers this service in my jurisdiction”; “yes; we partially deliver this service for another agency”; “yes; we completely deliver this service for another agency”; or “yes; we collaboratively deliver this service with another agency”)*

- **If you share this function, element, or activity, please identify those governmental public health partners.**

- **How formal are your sharing relationships for this function, element, or activity?** *(multiple choice; potential responses included: “informal”; “shared governance”; “formal: contractual”; “formal MOU or interlocal agreement”; “other”) If other, describe with agency name in column to the left.*

Governmental public health agencies were only expected to respond as needed to communicate their current sharing relationships with other members of the governmental public health system. One challenge related to reporting sharing, is that the CPHS definitions are agnostic to what governmental public health provider provides the service. In some cases, the definitions might include a function, element, or activity where CDPHE and LPHAs may each have a role. Where this is the case, we do not consider each type of agency fulfilling their role as “sharing.” Rather, sharing only occurs when one or more of the agencies is delivering services outside of their role.

Further, we incorrectly anticipated, that because the CPHS are a subset of all public health services which meet key criteria, including that they are services where the governmental public health system is the only or primary provider of the service, statewide, this would be sufficient to identify all relevant sharing.

However, CPHS also represent a new service paradigm. As such, there are many examples
of governmental public health agencies sharing with other governmental, quasi-governmental, community-based, nonprofit, and even for-profit organizations.

We allowed governmental public health agencies to report any activities they considered sharing, providing the rules of thumb that activities provided by governmental and quasi-governmental organizations, or organizations grant-funded to support governmental public health agencies work, was sharing, while contracting with non-governmental entities and compensating them for that work, was to be reported as an operating cost, rather than sharing.

Because governmental public health agencies only needed to respond to these questions as needed to communicate their current sharing relationships, they did not necessarily need to respond to each definition or even definitional component.

Instead, we interpreted function-level responses as applying to all elements (definitions) and activities (operational definitions) and element-level responses as applying to all subordinate activities.

Where agencies responded to both a function and element, we defaulted to the more detailed response (that is, the response for the element). The same was true for functions/elements and activities.

Self-Assessment

We asked two governmental public health agencies to self-assess the capacity (the staff or other labor resources with the ability and associated materials and supplies) and expertise (the appropriate knowledge and skills) with which the public health elements and activities they govern were delivered in their communities, using a likert scale from one to five as shown in Exhibit B - 4.

We asked governmental public health agencies to self-assess both their capacity and expertise, in recognition that there is a difference between the resources needed to do their work (capacity) and the knowledge needed to do their work (expertise).

In other words, there are activities where an agency may have the expertise or knowledge to do the work, but may not have the resources (high expertise, but low capacity), and that there are some services where an agency may have flexibility in resources but those resources may not have the appropriate knowledge, skills, or training (low expertise, high capacity).

The likert scale is not linear; that is, a score of 1 on the likert scale doesn’t mean the element or activity is 0 to 20% implemented, nor does a score of 5 on the likert scale mean that the element or activity is 80 to 100% implemented. Rather, the scores directly map to the rubric as ordinal values, such that a score of 1 means that the activity is not being provided and a score of 5 means the element or activity “fully meets requirements”.

This was extremely challenging, for many LPHAs, despite the fact that LPHAs powers and duties establish that they must “provide or arrange for the provision of CPHS,” which

Exhibit B - 4. Self-Assessment Rubric

<table>
<thead>
<tr>
<th>SELF-ASSESSMENT SCORING RUBRIC</th>
<th>EXPERTISE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CAPACITY</strong></td>
<td><strong>EXPERTISE</strong></td>
</tr>
<tr>
<td>Not Currently Provided</td>
<td>Not Currently Provided</td>
</tr>
<tr>
<td>Able to Provide the Basics at a Lower Level of Service</td>
<td>Meaningful Gap in Skills or Knowledge</td>
</tr>
<tr>
<td>Fully Meets Requirements</td>
<td>Fully Meets Requirements</td>
</tr>
</tbody>
</table>

Source: Habile, 2019.

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2 C.R.S. 25-1-506(3)(a)

Source: Habile, 2019.
implies that they should be aware of and monitoring services being delivered on their behalf. Despite careful validation, we still anticipate that some LPHA scores may more accurately reflect their agency’s abilities than the capacity and expertise with which elements and activities are delivered for their community (including by others).

LPHAs were asked to respond for each element and activity. This may, intuitively appear duplicative, as theoretically, activities should “add up” to the elements. However, one of the challenges is that “the whole [element] may be greater than the sum of its parts [activities].” This is a greater concern at the extremely detailed element and activity level, because the narrow nature of those definitions leaves more room for gaps in the definitions due to intangible things that governmental public health agencies may be doing.

As such, we asked LPHAs to respond at both levels to provide the most robust possible dataset. It is possible, that by reviewing where there are patterns of inconsistencies between element and subordinate activity scoring, we could identify areas where the activities do not adequately describe the elements and use that information to advance the CPHS Operational definitions.

4 Service Access (for direct and indirect services)

One of the things we’ve identified in this work, is that, implementation, as assessed through evaluation of governmental public health agencies’ capacity and expertise has multiple facets.

Self-assessment data about the capacity and expertise with which the activities are being delivered doesn’t provide any information about what that capacity or expertise “buys” in terms of work being completed or access to services being provided to residents. That is, elements and activities will capacity and expertise scores less than five might mean to not all pieces of the element or activity work being implemented, the element or activity work not being implemented on behalf of everyone, or any combination of the two.

To get a better understanding of the potential relationship between capacity and expertise scores and service access, we asked governmental public health agencies to assess service access for direct and indirect services (which had been identified as part of Assessment Tool development). For direct services, we asked agencies to “estimate the share (%) of the demand for this direct service in your jurisdiction that your agency is able to meet?” For indirect services, we asked agencies to “please estimate the share (%) of your jurisdiction that protected or for whom health is promoted by this indirect service?”

To enhance our understanding of services access limitations, we also asked governmental public health agencies to describe any non-financial barriers to service access they might perceive ("please describe what, if any, non-financial barriers to service access you perceive. If there is a barrier to serving a specific population, please identify the barrier and population.")

5 Current CPHS-related Spending

We asked governmental public health agencies to estimate their current CPHS-related spending at the function level (“What resources did you spend on this function in FY 2018?”). This was a difficult exercise, as the CPHS Operational Definitions, including the functions, represent a new service paradigm, and do not generally match their existing accounting and reporting structures. In many cases, this means that governmental public health agencies have to go through an allocation exercise to assign their FTE and labor, operating, capital, and in-kind costs to the CPHS functions, as described below:

- **Function-specific Labor Costs.** The salaries and benefits of staff that contribute to the function.

- **Function-specific Operating Costs.** Costs related to day-to-day function elements and activities. Examples include materials/supplies, small equipment such as specialty lab equipment, professional services, and other contracted services. Note that, per the framework, some agencywide operating costs were reported centrally in the Foundational Capabilities, including:
  - Facility-related and fleet costs are

- Data systems costs are reported centrally in Organizational Competencies, function “information technology/Informatics (IT)” (A.5.e.).

- **Function-specific In-kind.** The estimated value of any goods, services, or transactions that you receive for free and use or “spend” to help you the function.

LPHAs were asked to use a retrospective cost-estimation approach, whereby existing data and information was used to estimate the resources currently spent on each CPHS function, based on fiscal year 2018 to assess their current spending on the CPHS. Based on the significant variation in governmental public health agencies’ existing accounting and data systems, it’s likely that some individual governmental public health agencies used micro-costing methods (whereby they combined data on each of the CPHS function’s elements and activities) while others used gross costing methods (whereby they aggregated data to estimate the share of cost associated with each CPHS function).

One of the challenges governmental public health agencies encountered in their allocations, was the fact that, while some agencywide operating costs were reported centrally in the Foundational Capabilities, many others were not. Common examples included insurance, reception, phones, shared office supplies, and postage.

In most cases, we asked governmental public health agencies to allocate these costs across the CPHS framework based on their FTE allocations (as many of these costs, phones and office supplies in particular, are driven by FTE). However, in future CPHS Operational Definitions, or at least reporting, it may make sense to allow governmental public health agencies to report these costs in a central location.

To provide additional nuance to the current spending data collected, we also asked governmental public health agencies to “allocate, as a percentage, your current spending for this function across its elements and activities.” This was done for each function, such that the activities within that function added up to 100%. This was helpful, in preventing the perception that the elements and activities are all the same “shape and size,” when, in fact, fully implementing some activities might be a much larger or more significant endeavor than others.

6 Fees

We asked governmental public health agencies to, specific to the CPHS Operational Definitions, identify the activities for which they charge a fee. Specifically, we asked “Do you charge a fee for this activity? If so, what type?” (multiple choice; possible responses included: “no”; “yes, non-clinical fees and fines”; “yes, Medicare/Medicaid”; “yes, patient personal fees”; “yes, private health

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Each possible response to this question first confirmed or denied whether the agency charged a fee for the activity. If the agency confirmed a fee was charged, the possible responses allowed them to select the type or types of fees charged among the following options – non-clinical fees and fines, Medicare/Medicaid, patient personal fees, or private health insurance – or any combination of those options. These options crosswalked to question 10 (Please provide your agency’s total FY 2018 revenues by source) and 13 (With as much granularity as possible, please provide your agency’s total FY 2018 fees and fines by source/program/service) of the 2019 Annual Report.

Because governmental public health agencies only needed to respond to these questions as needed to communicate where they felt strongly about future opportunities to share CPHS, they did not necessarily need to respond to each definition or even definitional component. Instead, we interpreted function-level responses as applying to all subordinate activities. Where agencies responded to both a function and element, we defaulted to the more detailed response (that is, the response for the element). The same was true for functions/elements and activities.

CPHS Needs Assessment Future State Questions

7 Sharing Opportunities

We asked three questions designed to help us understand what CPHS functions, elements, and activities might best lend themselves to future sharing relationships and which agencies were willing to share those functions, elements, and activities:

- **Is there a benefit to delivering this function, element, or activity locally? If yes, please describe.**
- **Would you consider sharing this function, element, or activity with another governmental public health agency?** (multiple choice; possible responses included: “no”; “yes, I would deliver this for others”; “yes, I would have another agency deliver this for me”)
- **As needed, please provide comments related to your willingness/opportunities to share this function, element, or activity.**

Because governmental public health agencies only needed to respond to these questions as needed to communicate where they felt strongly about future opportunities to share CPHS, they did not necessarily need to respond to each definition or even definitional component.

Instead, we interpreted function-level responses as applying to all elements (definitions) and activities (operational definitions) and...
Barriers to Full Implementation

We asked governmental public health agencies to opine on any non-financial barriers they face in full implementation of CPHS; specifically, we asked “Please describe, what, if any, non-financial barriers to full implementation of this function, element, or activity that you perceive.” Non-financial barriers are impediments to implementation that increased funding (which could be converted to capacity/expertise) alone would not solve.

Because governmental public health agencies only needed to respond to these questions where they encounter a non-financial barrier, they did not necessarily need to respond to each definition or even definitional component. Instead, we interpreted function-level responses as applying to all elements (definitions) and activities (operational definitions) and element-level responses as applying to all subordinate activities. Where agencies responded to both a function and element, we defaulted to the more detailed response (that is, the response for the element). The same was true for functions/elements and activities.

Full Implementation CPHS-required Resources

We asked governmental public health agencies to estimate the full cost of implementing CPHS at the function-level (“What are the total annual resources your agency would need to fully implement this Core Public Health Service?”).

Consistent with the current spending estimates that they generated previously, we asked governmental public health agencies to report their costs across four categories: FTE and labor, operating, capital, and in-kind costs. LPHAs were asked to use a prospective cost-estimation approach to generate full implementation costs based on expectations about resource need generated by stakeholders knowledgeable about the CPHS.

Recognizing that the CPHS Needs Assessment is being completed as part of a broader public health system transformation effort, we actively discouraged governmental public health agencies from merely building on their retrospective current spending estimates (incremental budgeting) in generating their full implementation costs. This is because we wanted governmental public health agencies to think transformatively, even within the existing service delivery paradigm, about how they might fully implement CPHS if they were not resource-constrained.

Instead, we encouraged governmental public health agencies to treat this as a zero-based budgeting exercise. However, it’s expected that governmental public health agencies’ prospective full implementation cost estimates are informed by retrospective information around salaries and benefits, operating costs, and existing in-kind resources that would be expected to persist regardless of governmental public health agency transformation (for example, in-kind provision of facilities by some counties).

Also consistent with the current spending estimates governmental public health agencies provided, we asked them to “allocate, as a percentage, the total annual full implementation cost for this function across its elements and activities.” Again, this was done for each function, such that the activities within that function added up to 100%. This helped to understand the final “shape and size” of fully implemented CPHS functions, elements, and activities.
The full implementation costs generated by governmental public health agencies represent point-in-time estimates of normal, annual costs for fully delivering CPHS.

They do not consider the costs of implementation; that is, the resources that might be required to move from current implementation of CPHS to full implementation. Implementation costs might include things like the cost of hiring beyond normal annual hiring, ergonomic or other facility assessments to support housing of additional staff, organizational development and change management, and the policy work needed to support the CPHS initiative overall. It is expected that these costs will be material.

To get a better sense of these costs, we asked governmental public health agencies to estimate them at the function level, specifically asking “what one-time implementation resources will your agency need to fully implement this function?” Consistent with the current spending and full implementation cost estimates that they generated previously, we asked them to “allocate, as a percentage, the one-time implementation resources your agency would need to fully implement this function.” Again, this was done for each function, such that the activities within that function added up to 100%. This was designed to help understand where one-time implementation costs might be expected.

**Sign-off**

We asked respondents to “sign-off” each Assessment module with the name, title and email of the staff member responsible for answering it, as shown in Exhibit B - 6, below. The “sign-off” provided assurance that respondents had completed that module to the best of their knowledge, while also providing information on the respondent for reference during validation.

**Dashboard Tab**

The Dashboard tab summarized the function-level current spending; self-assessment capacity and expertise; and full implementation cost, including one-time implementation costs, of CPHS. This allowed assessment point-of-contacts to review their agency’s overall results before signing-off (certifying that the Assessment was complete and the results accurate to the best of the point-of-contact’s knowledge) and submitting their Assessment Tool.

**Hosting via SharePoint**

We developed the Colorado Public Health System site as a central repository and hosting platform for each governmental public health agency’s Assessment Tool and all assessment materials. The site allowed governmental public health agency access the Assessment Tool in Excel Online, to ensure each governmental public health agencies had access to the full functionality of the Assessment Tool, regardless of the Excel desktop program they have, and to support a consistent user experience.

Cloud hosting via SharePoint also meant that governmental public health agencies did not need to save the Assessment Tool locally – preventing version control or other file management issues – while also allowing them to access and complete the Assessment Tool on their own schedule, starting and stopping as necessary without losing work.

SharePoint also supports maximum collaboration for governmental public health agencies and between governmental public health agencies and Habile, by allowing multiple users to access the Assessment Tool and complete it together, at the same time.
Collaboration is supported down to the cell level, with real time updating, in Excel Online.

The site was organized using document libraries that include a folder for each governmental public health agency’s Assessment Tool and a folder for Technical Assistance materials. These folders were protected, such that governmental public health agencies only had default access to their own Assessment folder, to protect governmental public health agency privacy during the assessment. However, we could and did provide governmental public health agency’s access to one another’s Assessment Tools upon request with the permission of those agencies.

Governmental public health agencies were encouraged to complete their Assessment Tool live on the Site using Excel Online to prevent any compatibility issues, maximize their ability to collaborate, and support Habile’s ongoing management.

The tool(s) will be released using Microsoft Excel Online, both of which have the benefits of being able to run on browsers found on most computers, does not need to be saved locally, and does not require participants to own Microsoft Office.

**Data Collection Process**

CDPHE and the 53 LPHAs, and Denver Public Health, participated in largely the same data collection process. That is, all 55 agencies were given access to their Assessment Tool and given a set amount of time to complete it; although CDPHE and LPHAs responded in slightly different windows. More information about the small differences between CDPHE and LPHAs data collection processes are provided following.

All 55 agencies were supported in their data collection processes by comprehensive technical assistance provided by Habile, as well as support from CALPHO and CDPHE OPPI.

**Comprehensive Technical Assistance**

Recognizing that the Needs Assessment data collection process would be challenging, Habile, with targeted support from CALPHO and CDPHE OPPI, provided comprehensive technical assistance.

This technical assistance was designed, not only to foster consistency and validity in governmental public health agencies’ assessment responses, ensuring a high-quality final primary dataset, but also to achieve 100% response rate by helping agencies calibrate their level of effort on the Assessment Tool to the time and resources they had available.

Habile offered both passive and active technical assistance support, which included:

- **A 2019 CPHS Needs Assessment website** built on Microsoft SharePoint, on which project materials were made easily accessible to respondents. In addition to providing a centralized library of assistance resources, the 2019 CPHS Assessment website allowed Habile to correct identified issues with tools, view governmental public health agency’s progress-to-completion, and work concurrently with agencies throughout their work to respond to the Assessment Tool.

- **Orientation and ad hoc topic webinars** orienting Assessment respondents to the Assessment data collection process and Tool and responding to identified issues on an as needed basis.

- **Assessment process resources** that provided process-related technical assistance materials; this included, a handout outlining the technical assistance process, schedule, and resources. It also included contextual information related to the assessment process, such as the completed operational definition manual, will be included on the 2019 CPHS Assessment website.

- **Instruction guides and Assessment Tool-related resources** that allowed Assessment respondents to work through the materials at their own pace and find answers to questions when they need them. These guides will include user guides for SharePoint, webinars, and the Assessment Tool.

- **Individual assistance by phone and/or email** responding to Assessment respondents individual questions and issues related to the Assessment data.
COLLECTION AND INCLUSION OF DENVER PUBLIC HEALTH AND NORTHWEST COLORADO HEALTH DATA

Although the data collection process was originally intended only to engage the governmental public health system (CDPHE and 53 LPHAs), we identified a need to collect data from two close system partners, as described below:

- Denver Public Health (DPH). Denver Department of Public Health & Environment (DDPHE) is the only LPHA structured as “a single-county LPHA coordinating with a quasi-governmental organization.” The City and County of Denver adopted a Charter amendment in 1996 to replace the Department of Health and Hospitals with the Department of Environmental Health (DEH). The Denver Health and Hospital Authority was formed as a state authority to operate the former Denver General Hospital. DEH retained the authority and regulatory powers of the LPHA, and through a voter approved ballot measure in 2017, changed its name to the Denver Department of Public Health & Environment (DDPHE) to better reflect its role as the LPHA for the City and County of Denver. Denver Public Health, a department within Denver Health and Hospitals, enters into an annual contract with the City of Denver to provide some public health services. DDPHE and DPH have an annual operating agreement that governs their relationship (that is, what each agency provides). Because of the nature of DDPHE and DPH’s relationship, and because DPH has roles and responsibilities related to delivery of CPHS, not collecting information about the current spending and cost of full implementation related to DPH’s responsibilities would have left a gap in our analysis. As such, we asked DPH to respond to the Assessment Tool, for all CPHS services they deliver. We worked with DDPHE to integrate these results with their own, to prevent duplication and gaps.

- Northwest Colorado Health. Up until 2018, Jackson, Moffat, and Routt County Public Health Agencies were delegating the majority of their governmental public health services (LPHA activities) to a nonprofit, Northwest Colorado Health. As of 2019, these LPHAs are no longer delegating the LPHA role, however, Northwest Colorado Health may still be delivering some services on their behalves. As such, Northwest Colorado Health had their FY 2018 spending data. Rather than ask Northwest Colorado Health to respond to the Assessment Tool, all three LPHAs provided them with a data request that they graciously fulfilled. The data they provided was used in Jackson, Moffat, and Routt County Public Health Agencies’ Assessment Tool responses.

Some additional technical assistance resources specific to LPHAs or CDPHE were also developed. These are described as part of the Appendix D: Detailed Needs Assessment Data Collection and Validation Process and Methodology, Data Collection Process, LPHA and CDPHE Data Collection sections, following.

- **One-on-one and live technical assistance sessions** provided to LPHA cohorts and individually in response to group questions or issues that cannot be solved through typical individual assistance. These sessions were generally conducted by phone conference with a shared screen, and included multiple staff members and project team representatives as needed.

- **A CPHS Needs Assessment FAQ Digest** provided answers to frequently asked questions as the assessment progressed. The digest was updated regularly to reflect answers to collected questions and issues for the benefit of all Assessment respondents.

- **Ongoing communications** to governmental public health agency directors and Assessment point-of-contacts with information about the CPHS assessment process, announcing the availability of new technical assistance resources, scheduling webinars, and providing reminders regarding Assessment data collection milestones and deadlines.

**LPHA Data Collection Process**

The LPHA Needs Assessment Data Collection
launched on May 10th, with an original due date of July 10th (approximately 9.5 weeks), which was formally extended to July 19th, giving LPHAs 11 weeks to respond. The final LPHA submitted their data on August 29th. Subsequent validation efforts required several LPHAs to provide additional data up until mid-October.

As a starting place, we reached out to each governmental public health agency, through their LPHA administrators, who were default point-of-contacts for the assessment process. LPHA administrators were given the opportunity to delegate the Assessment point-of-contact responsibility to a staff member of their choice. Assessment point-of-contacts were responsible for:

- Managing communication with the the Habile Team and acting as the Assessment Liaison for their LPHA and staff,
- Delegating Assessment responsibilities within their LPHA,
- Tracking Assessment completion to schedule, and,
- If the Point-of-Contact was not the LPHA Director, keeping the LPHA Director apprised of Assessment progress and results.

Slightly less than half of participating LPHAs formally assigned a point-of-contact other than their LPHA Director. These point-of-contacts were most often deputy or assistant directors, administrative directors, or accounting managers, although there were exceptions.

We encouraged LPHA point-of-contacts to assemble a team to complete the Assessment Tool, believing that an effective response would require the input of leadership, financial, and program staff. These teams obviously varied among LPHAs – with much smaller teams (or sometimes individuals) completing smaller LPHAs’ Assessment Tools.

When requested, we worked directly with governmental public health agencies to identify who should contribute to completing the Assessment Tool based on their unique organizational structures.

In all, over 205 LPHA staff are known to have directly participated in the Needs Assessment Data Collection process; if we were to consider all of the people within LPHAs who answered questions or provided data for this purpose, that number might be much higher.

Once the Assessment Tool was launched, Habile offered three orientation webinars as part of the Assessment Tool launch. These orientation webinars were designed to orient LPHAs to the Needs Assessment purpose, goals, and data collection process, and give LPHAs guidance on how to get started with the Assessment Tool.

LPHA point-of-contacts were encouraged to share the invitations with all LPHA staff members who might be participating in the Assessment. The sessions were recorded and distributed as an additional technical assistance resource. Between the three orientation webinars, we had over 100 unique participants, representing all but five LPHAs. We reached out to provide the link to the recording to the five LPHAs who were unable to join live.

One of the things that was evident through the process, was that it was significantly more difficult for extra-small LPHAs (those serving 30,000 or fewer Coloradans) to complete, as their size compounded the challenge of the exercise in terms of time commitment and the challenges of allocating extremely limited resources across a broad framework, with 53 functions.

To address the second challenge, we developed a “scratch paper” allocation tool that allowed LPHAs to upload their existing fiscal year 2018 spending data and directly allocate those costs across the CPHS functions, providing a summary that could be directly copy-pasted into their Assessment Tool.

While this “scratch paper” tool was designed with extra-small LPHAs in mind, we found that it could be useful to larger LPHAs, including those allocating program/division/branch/department-level resources, so we distributed it broadly.

In some cases, we worked directly with these larger agencies to customize the tool with multiples worksheets, one for each program/division/branch/department and in creating a final summary that adds the results from all of those sources to a summary that could
be directly copy-pasted into their Assessment Tool. In all, approximately 32 (about 60%) of LPHAs used the “scratch paper” allocation tool to support their current spending allocations.

However, even with the “scratch paper” allocation tool, allocating scarce resources was challenging for LPHAs. In particular, there were challenges allocating activities that represent multiple functions. We encouraged LPHAs to allocate FTE and labor costs based on the expertise being delivered and allocate other costs based on the FTE or labor that uses them. In the end, parsing out what costs should be allocated to which functions required the good judgement of LPHAs.

This issue (allocating scarce resources) was so important that we hosted two webinars on this topic. We also hosted one webinar designed to help LPHAs think transformatively about full implementation and two open office hours sessions.

To further support extra-small agencies, we provided individual support to them through a technical assistance process whereby we worked directly with their staff to allocate their FY 2018 current spending, walked through the programmatic questions together (either creating a plan for the LPHA to complete them or working directly with the LPHA to complete them), and provided approaches to generating full implementation estimates. We used this process to work closely with over 18 LPHAs.

Throughout the course of our live and one-on-one technical assistance, we talked to all 53 LPHAs and Denver Public Health, working closely with over half to complete their Assessment Tools. This level of involvement in the LPHA data collection process paid dividends in the validation process, discussed following.

The CPHS Needs Assessment data collection process was extremely labor intensive for LPHAs and was well beyond their normal time commitment and duties for responding to CDPHE OPPI’s Annual Report. It also came at a difficult time for many counties, as LPHA budgets are due to local boards of health by September 1st. Several LPHAs also faced specific challenges related to the time frame (e.g., other initiatives, key personnel out of the office, etc.).

### CDPHE Data Collection Process

CDPHE is one agency with a single budgeting and accounting system, which allowed for a simpler approach to data collection (versus what was needed to ensure consistency among the 53 LPHAs and Denver Public Health) however, with the added challenge around its size and complexity as an organization, and the magnitude of its service area.

Habile worked with the CDPHE OPPI to identify Assessment respondents based on CPHDE’s current (as of May 2019) organizational chart.

We identified that Division directors would be primarily responsible for the programmatic questions related to their program work as well as generating full implementation estimates for any work that they lead (with input from other, related program staff from other related branches), with the exception of the Prevention Services Division, as there was a vacancy in that Division at that time. Instead, three chiefs and/or their deputy’s, from three branches (Children, Youth, and Families; Health Promotion and Chronic Disease Prevention; and Violence and Injury Prevention – Mental Health Promotion) under that Division teamed up to complete the sections that would have been assigned to that Division Director.

We leveraged the “scratch paper” allocation tool to support CDPHE in providing current spending estimates for SFY 2018. We created one allocation worksheet for each Division (or Office, etc.) as needed. Division fiscal services managers were responsible for allocating Division SFY 2018 spending across their allocation worksheet.

We recognized that allocation of SFY 2018 resources was an area that could easily invite duplication or gaps in CDPHE or governmental public health system-wide spending. As such, we gave fiscal services managers the following guidance:

- Allocate the resources for your Division only; resources that individual Divisions may access in/from another Division will
be recorded and allocated by that Division.

- Report direct spending by CDPHE on public health – do not report pass-through grants and contracts made to LPHAs and others, as LPHAs will report on those pass-through dollars and duplication would overstate systemwide spending on these functions, elements, and activities. CDPHE should report any contracts for services related to CDPHE direct public health role (for example, if they hire professional services or a community-based organization to support CDPHE’s own public health role), and include those costs in their operating costs.

- Do not report your internal indirects paid to Administration and Support, Community Relations Division, or other Divisions. Again, we’re only allocating direct spending, so those monies will be reported by the payee (Administration and Support, Community Relations Division, or other Divisions who receive them and spend them on their own work).

Recognizing that this is a difficult exercise, with many moving parts in an agency as large as CDPHE, we scheduled orientation meetings for those respondents completing each section (Foundational Capability or Service) of the Assessment. These orientation meetings took approximately 30 minutes to one-hour, depending on the number of branches and, thus, staff involved in each Foundational Capability or Service, and were scheduled at respondents convenience over the first few weeks of June.

While branch directors were only directly responsible for the questions they were assigned related to their program work, it is likely that other Assessment point-of-contacts reached out to them to provide data related to other functions. This was particularly likely in the case of Foundational Capabilities, as those functions, elements, and activities are cross-cutting activities that may be both centralized and decentralized within CDPHE (for example, while CDPHE has a centralized Office of Communications, there may be decentralized communications staff and functions throughout other Divisions and Branches).

We worked closely with many CDPHE Needs Assessment respondents starting when the process launched on May 30th until the final data was received September 9th, a little less than 14 weeks later.

In all, at least over 44 CDPHE staff are known to have directly participated in the Needs Assessment Data Collection process; however, it is likely that even more CDPHE staff answered questions or provided data for this purpose, such that number is actually much higher.

**Response Rate**

As discussed previously, as part of the Needs Assessment Data Collection process, we sought to collect primary data from all 54 governmental public health agencies in Colorado, as well as close system partner Denver Public Health and NWCH. To do this, we developed an Excel-based Assessment Tool to collect consistent data from all respondents. This Assessment Tool included 13 data collection tabs, one for each foundational capability and service and one to act as LPHAs 2019 Annual Report to CDPHE OPPI.

However, as mentioned previously, many of the questions asked throughout the Assessment Tool only needed to be answered on an “as-needed” basis or did not need to be answered for every definition or even definitional component. This meant that the expected datapoints from each respondent was much lower, and that the actual data received might vary from respondent to respondent.

We also knew, that by allowing flexibility for respondents to respond to some questions on an “as-needed” basis, there were some areas where we’d have a response rate (n) of less than 54. In many of these areas, we assumed that additional data would only serve to reinforce what we learned from more active respondents, so it wasn’t necessary to increase response rates in those areas.

To address this, we defined what level of response would constitute a “completed” Assessment Tool, such that the response would include:

- Complete 2019 Annual Report tab and sign-off
- Identification of current sharing relationships for all functions
Self-assessment of capacity and expertise for all elements and activities
Complete current spending allocation for all functions (recognizing that current spending might be 0 FTE and $0 for some LPHAs in some areas)
Complete full implementation estimates for all functions
Dashboard sign-off

Counting zeros as a datapoint, the complete primary dataset includes thousands of data points per governmental public health agency. The ancillary information collected from respondents represents thousands of additional data points.

Validation
The technical assistance process was designed to ensure that governmental public health agencies responding to the Assessment had a shared understanding of the scope of the Assessment, including the programmatic framework; Assessment content and questions; and how to correctly use the Assessment Tool in order to provide data accurate to the desired order of magnitude.

We find that technical assistance has an inverse relationship with data validation; the more technical assistance provided the less need for data validation later on. As such, we invested considerable time in technical assistance, working directly with all 55 respondents, and working closely with over half to complete their Assessment Tools.

Despite this, we developed a data validation process to ensure the accuracy of the data collected during the Assessment data collection process. Prior efforts in other states have shown that while there will be some amount of random error from respondents, there will also be unexpected findings that represent valid outliers. Validation is the effort of separating errors from outliers.

Data were validated through a number of methods, some of which were built into the Assessment Tool, and some of which were completed through post-collection analysis. Once data was submitted, it went through a two-step process consistency review; each step, as well as any salient issues identified during that step, is described following.

When issues are identified through one of these methods, validation efforts included reaching out to representatives from individual governmental public health agencies to request information in those cases where results appear to be outliers. For errors, Habile assisted governmental public health agencies in correcting their data.

Validation ensures that the final data is usable and that governmental public health agencies understand both their own and the overall Needs Assessment results and the implications of those results.

1. **Review individual Assessment Tools for Internal consistency (at the respondent level).** Are the responses from each governmental public health agency internally consistent? For example, do the labor costs make sense given the number of estimated FTE? Can an governmental public health agency that needs 10 FTE for one foundational program only need 0.5 FTE for another foundational program?

This first phase of the validation process identified a few key issues that were considered across governmental public health system respondents:

- **Variation in work week (number of hours considered FTE).** There are a couple of single-county LPHAs subordinate to counties operating under a less than 40-hour work week where FTEs are less than 2,080 hours per year. For consistency across all respondents, we asked these agencies to adjust their current spending allocations and full implementation cost estimates to a 2,080-hour FTE basis.

- **Accurately reporting county contributions.** LPHAs are often broadly supported by their counties, and more narrowly by other county department, both in terms of revenues and in the delivery of public health services. These relationships are highly variable, examples include:
  - Cash appropriations LPHAs receive directly
  - Rent and/or supportive services that CDPHE or LPHAs receive in-kind
Rent and/or supportive services that CDPHE or LPHAs pay for directly or indirectly
Rent and/or supportive services that CDPHE or LPHAs receive in-kind
Direct services that other agencies provide that CDPHE or LPHAs pay for, including, per statute direct CPHS services delivered by the County Treasurer, County Attorney, and County Clerk.
Direct services that other agencies deliver outside of the governmental public health system

We found that, in many cases, LPHAs did not account for these in-kind revenues and services in their total revenues or in their current spending allocations; in many cases LPHAs would report these contributions on only one side of the equation (revenues or spending). We worked with LPHAs to account for these revenues and services, and to ensure they were reported equally on both sides of the equation.

Ensuring in-kind is accurately reflected in both revenues and “spending.” Similarly, where LPHAs received in-kind support (for example, from physicians volunteering as the LPHA’s medical officer) they often reported these contributions on only one side of the equation (revenues or spending). We worked with LPHAs to account for these revenues and services, and to ensure they were reported equally on both sides of the equation.

Predicting the continuation of in-kind support. Many LPHAs assumed that, given full implementation resources, they would replace in-kind support they were currently receiving. However, this is not always the case - especially as many receive in-kind support from their counties. It is likely that, in many cases, counties that currently provide in-kind support (e.g., in-kind provision of county facilities) to LPHAs, as it is consistent with how they manage their facilities across all county departments. However, it is possible that additional financial resources might supplant some in-kind resources. We encouraged LPHAs to only supplant in-kind resources, if it was likely (or preferred) that they be replaced by paid resources.

2. Review all governmental public health agency responses as an overall dataset for overall consistency (across and among respondents). Individual agencies’ Assessment data was rolled up to develop a system-level dataset that also had to be validated, to ensure that it was both comprehensive and without duplication. That is, are the estimates reasonably aligned among governmental public health agency?

For example, if every governmental public health agency reported needing $25,000 or more to fully implement an element, could an LPHA serving 100,000 people need $2,500?

This second phase of the validation process identified a few key issues that were considered across governmental public health system respondents:

Preventing duplication in reporting revenues and spending related to shared services. A key issue related to validation is in preventing duplication in reporting spending related to shared services: For example, if Agency A pays Agency B to provide a service for them then both Agency A and Agency B might have “spending” related to that service:

Agency A’s “spending” would be the resources paid to Agency B for the service
Agency B’s “spending” would be the expenditures “on the ground” related to providing the service (staff, operating costs, supplies, equipment, etc.)

We instructed agencies to report only their “on the ground” spending on public health activities, and not pass through amounts to other members of the governmental public health system. We have enough data to identify and isolate examples of these transactions where both agencies might have reported costs, and have addressed this issue to the degree necessary to ensure

These consistency checks represent data cleaning, which narrowed our list of actual outliers. For those outliers that were
confirmed by governmental public health agencies, we completed a deeper dive of to understand the nature of and logic behind them, considering, for example:

- Why are the estimates inconsistent? Do they represent a difference in demand drivers or how, to what extent, or with what expertise work is being performed?
- Is the result possible? For example, if a LPHA provides an extremely low estimate for a particular element, are they accounting for realistic costs for the resources they need to do that work?
- Are the estimates consistent with other system-level data (for example, previous CDPHE OPP! Annual Report data)?

In some cases, we let outliers stand. This is because the validation process attempts to identify all outliers and explain them, while respecting individual LPHA perspectives and logic.

However, in some cases we have refined the results through limited standardization to correct for these validated outliers. Where these “validated outliers” may affect the validity of the final statewide estimates, we have corrected for them using limited standardization, as discussed in the Overall Report Core Public Health Services Needs Assessment Development, Methodology, Financial Analysis section.

Not every potential outlier was at an order of magnitude we addressed during validation. Some outliers, some of which may be errors, fall below our review threshold. This is because these errors are insignificant in the generation of a planning-level statewide estimate.

**Limitations**

As with any data collection process, there are certain inherent limitations. Whenever possible, we mitigated these limitations. Both the limitations and any mitigating factors are described, following.

First, this process collected self-reported data from governmental public health agencies. As with all self-reported data, there is the potential for respondent bias, especially if there are perceived benefits to particular responses (for example, showing a more severe funding need in an effort to sway future funding decisions).

Respondents may also have a difficult time accurately assessing their own capacity and expertise. In general, even though these scores are not intended to be evaluative, it can be difficult for governmental public health agencies to acknowledge a deficit in their ability to do their work. For example, participants are more likely to report a lack of capacity than a lack of expertise.

Further to this point, we asked LPHAs to self-assess the capacity and expertise with which CPHS elements and activities they govern are delivered in their communities, rather than just their capacity and expertise as an agency. This was extremely challenging for many LPHAs, despite the fact that LPHA’s powers and duties establish that they must “provide or arrange for the provision of CPHS,” which implies that they should be aware of and monitoring services being delivered on their behalf. Despite careful validation, we still anticipate that some LPHA scores may more accurately reflect their agencies’ abilities than the capacity and expertise with which elements and activities are delivered for their community (including by others).

Second, the nascent CPHS framework and operational definitions were the programmatic framework for the Assessment. These definitions are still very new - and won’t even become active administrative rule until January 2020 and are not yet accompanied by minimum quality standards.

They are also extremely detailed and complex, as the definitional components nest. As such, respondents likely had differing familiarity and experience with the CPHS framework and operational definitions that could lead to differing interpretations of them.

Further, as the CPHS framework and operational definitions represent a new service paradigm, CDPHE and LPHAs’ existing accounting and reporting structures may not match, requiring them to go through an allocation exercise to assess current spending.

We used the Needs Assessment Data Collection process to begin building a shared understanding of the CPHS framework and
operational definitions, however, it is likely that this will be an ongoing process.

Third, variation in data collection by agency can lead to minor variation in our results. As part of this process, we collected data from 55 disparate agencies with different fiscal years, accounting methods, and FTE definitions. Aggregating data from all of these governmental public health agencies could easily invite duplication or gaps in systemwide spending.

Further, the data collected through this process is intended to generate a statewide understanding of the normal, annual costs of fully implementing CPHS and needs based on subtraction of current spending estimates for (S)FY 2018. Point-in-time estimates may not fully capture the potential for annual variability in services related to surge and emergency response, cyclical services, or capital costs.

Some agencies faced changes and challenges in (S)FY 2018 that could be considered outside the range of “normal,” potentially impacting the reliability of the period as a “normal” year.

Fourth, an effective response to this Assessment Tool required the input of leadership, financial and program staff. These respondents were likely to have differing levels of financial acumen and cost estimation experience.

It was evident that this exercise was significantly more difficult for extra-small LPHAs (those serving 30,000 or fewer Coloradans). This is especially significant given that based on the populations they serve (size) Colorado’s LPHAs have an asymmetric distribution, with 35 extra-small LPHAs (66% of 53 total) serving less than 7% of the population as of 2018.

In summary, the CPHS Needs Assessment data collection and validation process was extremely complex. It was also extremely labor intensive for LPHAs and was well beyond their normal time commitment and duties for responding to CDPHE OPPI’s Annual Report. It also came at a difficult time for many counties, as LPHA budgets are due to local boards of health by September 1st. Several LPHAs also faced specific challenges related to the time frame (e.g., other initiatives, key personnel out of the office, etc.).

Knowing that technical assistance has an inverse relationship with data validation (the more technical assistance provided the less need for data validation later on) we implemented comprehensive technical assistance to support robust data collection despite these limitations, We also validated this data to ensure that it was accurate to the desired order of magnitude.

Key Findings from Assessment Data Collection and Validation Process

While the CPHS Needs Assessment Data Collection and Validation Process was implemented to inform a primary dataset to describe the current implementation and spending on and estimate of the full cost of implementing CPHS in Colorado, there are several salient findings that are also valuable to the overall Needs Assessment. These findings include:

- The CDPHE Needs Assessment Data Collection and Validation Process generated a primary dataset that defines Colorado’s governmental public health service delivery paradigm, measures current implementation and spending on CPHS, estimates the cost of full implementation of CPHS, and provides insight into barriers and strategies for achieving full implementation of CPHS.

Counting zeros as a datapoint, the complete primary dataset includes tens of thousands of datapoints. The ancillary information collected from respondents represents thousands of additional data points. This primary dataset is a product of this process in and of itself.

- Need to build a shared understanding of the new CPHS framework and operational definitions.

Further, because there is significant interplay among the foundational capabilities and services governmental public health professionals need to be familiar with the full operational definitions manual, and not simply
definitions related to their particular subject matter expertise.

- **Need to continue to refine the CPHS operational definitions.**
  One of the areas where advancement is needed is in fleshing out the activities under each element such that they clearly “add up” to the elements, by continuing to articulate the more “intangible” things governmental public health does.

- **Work with LPHAs on strategies for evaluating the capacity of expertise with which CPHS elements and activities they govern are delivered in their service areas, rather than just their capacity and expertise as an agency.**
  This information should inform ongoing conversations about cross jurisdictional sharing between sharing partners.

- **Encourage all LPHAs to move to modified accrual accounting systems as suggested by GASB.**
  A modified accrual accounting system.
  It is possible that cash-basis-accounting agencies might understate expenses and revenues and accrual-accounting agencies might overstate expenses and revenues relative to modified-accrual-accounting agencies. Transitioning to modified accrual accounting may not be possible for all LPHAs as many are subordinate to counties, and therefore, must account under their counties’ preferred accounting method.

- **Jackson, Moffat, and Routt County Public Health Agencies are in a time of transition.**
  While these agencies have previously delegated the majority of their LPHA services to a nonprofit, Northwest Colorado Health, they have now begun a process to more directly manage their LPHA responsibilities.

- **If ongoing tracking and measurement of current spending on CPHS is desired, there is a need to create a streamlined process.**
  While this could be accomplished as part of CDPHE OPPI’s Annual Report process, another approach may be to develop a uniform chart of accounts.
  As part of ongoing tracking, the Public Health System Transformation Policy Collaborative should consider opportunities to allow governmental public health agencies to centrally report some operating costs, like insurance, reception, phones, shared office supplies, and postage. Governmental public health agencies generally don’t allocate these costs in their own system, so agencies have to allocate them (often by FTE) anyway. Doing this centrally within a uniform chart of accounts would allow for this allocation to be consistent across the system, improving overall data comparability among governmental public health agencies.
  The governmental public health system should also take great care to continue to ensure tracking can be done in such a way as to generate systemwide data that is unduplicated (that is, that public health dollars are only counted when they are spent on the ground, so as not to overstate revenues that might “pass through” multiple governmental public health agencies before being spent. Key to this may be continued maintenance of CDPHE’s new Expenditures by County and Division analysis, which can be used to “net out” pass through spending from CDPHE to LPHAs.
  Regardless of the approach to ongoing tracking taken, there is a need to support extra-small LPHAs (those serving 30,000 or fewer Coloradans) in responding to exercises like this, and the CDPHE OPPI annual report.

- **It is difficult for governmental public health agencies to think transformatively about governmental public health with the current fiscally constrained environment.**
  Governmental public health agencies are extremely fiscally constrained, such that many do not have experience with zero-based budgeting exercises, only incremental budgeting. If public health system transformation and full implementation of CPHS proceeds, LPHAs may need zero-based budgeting and other

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cost estimation training.

- **Continue to assess and refine estimates related to surge, cyclical costs, and emergency response and capital needs.**
  The cost estimates generated by governmental public health agencies will continue to be refined as this process evolves.

- **Communicate that the full implementation estimates generated by this Needs Assessment are for the annual costs of fully delivering the services, and do not include potential implementation costs.**
  As implementation scenarios are considered, the governmental public health system will be more able to estimate any potential one-time costs related to implementation. These estimates will be on top of the annual costs of delivering CPHS.

- **There is a need for comprehensive technical assistance and validation in all LPHA reporting to CDPHE.**
  The validation process was instructive in demonstrating the need for validation despite comprehensive technical assistance. CDPHE OPPI should consider this need in their future Annual Report processes.

- **CDPHE OPPI and LPHAs should work together to identify a preferred window for future Annual Report processes that meets both reporting deadlines and supports LPHA participation.**
  Although the CDPHE OPPI Annual Report is generally in late spring to early summer, LPHAs indicated that this is poor timing as their LPHA budgets are due to their boards of health by September 1st.
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2016 (pages 1-7).

Icons and Pictures

Icons

- Bacteria Inspection by ProSymbols from the Noun Project
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- Emergency by hafiudin from the Noun Project
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