Evaluation of the Sub-County Assessment of Life Expectancy (SCALE) Project

Final Report
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1.0 Introduction

1.1 Background of the SCALE Project
Recent public health efforts indicate that life expectancy (LE) is a particularly helpful indicator for detecting health disparities across geographic areas. These efforts also suggest that descriptive analyses of LE across small geographic areas hold potential for identifying modifiable risk factors contributing to such disparities—lending helpful information for consideration in public health program planning. Recognizing the potential added-value of having a standardized methodology for calculating LE for small geographic areas (i.e., sub-county) throughout the United States, the Centers for Disease Control and Prevention (CDC) provided funds to the Council of State and Territorial Epidemiologists (CSTE) to support a multi-year effort to facilitate the development and adoption of small area LE methods. In September 2014, CSTE initiated a collaborative project—the Sub-County Assessment of Life Expectancy (SCALE) Project—with representatives from six state and two local health departments to engage in the first of a multi-phase effort to develop, test, refine, and disseminate standardized methodologies for calculating estimates of LE at a sub-county level.

The aim of SCALE was to increase the capacity of state and local health departments to calculate and interpret small-area LE estimates to facilitate the identification of health disparities as well as potential upstream factors contributing to these disparities. Initial phases of the SCALE Project were designed to produce a variety of tools and guidance that could be easily used by state and local health departments in building this capacity. Phase I (January 2015-May 2015) participants received $10,000 to engage in the effort. With this funding and leadership from CDC and CSTE, the team conducted a literature review to learn more about existing methodologies for calculating sub-county estimates of LE; reviewed and pilot tested an existing instrument originally developed and published in the United Kingdom (SEPHO) to examine its potential utility; refined existing SAS and STATA code to align with the algorithm(s) published in the SEPHO tool; shared an overview of the first phase and the initial lessons learned with epidemiologists at the 2015 CSTE Annual Conference; and developed a draft “how to” guide (“The Guide”) for use by other epidemiologists and public health practitioners interested in utilizing the SEPHO tool.

Phase II (June 2015-June 2017) included participation from Phase I as well as additional jurisdictions that learned of the project primarily through presentations at the CSTE annual conference. These jurisdictions were oriented to the project, engaged in pilot testing the Phase I materials, and provided feedback through evaluation activities that were used to revise the Phase I products. The team subsequently revised the SCALE guide and disseminated lessons learned through peer-reviewed manuscripts and presentations at the CSTE annual conferences. Products of the project were also disseminated through a CSTE website dedicated to SCALE.

Throughout Phase II and afterwards, jurisdictions continued to join SCALE. As the project progressed discussions continued to focus on the refinement of methodologies for calculating

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2 [https://www.cste.org/page/SCALE](https://www.cste.org/page/SCALE)
and displaying sub-county LE as well as other topics such as data visualization techniques. Participants continued to update products and share lessons learned. As of Summer 2018, 32 jurisdictions had signed up to participate in the project.

1.2 Purpose of the Current Evaluation
Throughout the SCALE project, our evaluation team gathered data to respond to several key evaluation questions. In the early stages of this effort, we sought insights from Phase II participants to better understand how the content and format of draft products developed in Phase I could be improved to facilitate utilization by the public health community. In addition, we gathered insights about the resources that were required to calculate sub-county LE estimates using the methodology and steps proposed in the SCALE Guide. Team members used the insights from these early evaluation activities to revise the SCALE Guide and modify SCALE-related trainings conducted during annual CSTE conferences.

As the project progressed, and states and localities had an opportunity to calculate sub-county LE estimates and potentially disseminate the findings, we shifted the inquiry to the potential public health utility of sub-county LE estimates. Specifically, in the current report we aim to answer the question, “What is the potential public health utility of sub-county life expectancy estimates?” We took two approaches to answering this question. First, since dissemination of estimates is required for use to take place, we examined the extent to which SCALE participants were able to calculate and disseminate sub-county LE estimates as of the Summer of 2018 (Section 2.0).

Given the limited timeframe for this project and the fact that participating jurisdictions did so largely on a volunteer basis as time allowed and priorities aligned we also elected to examine efforts that came before SCALE was initiated (Section 3.0). Developing case examples of efforts that had more time to gain traction within communities seemed an important step towards realizing the promise sub-county LE estimates may hold with respect to informing public health actions. Ultimately we leverage the lessons learned from both of these routes of inquiry to provide a response to the evaluation question at hand, present a conceptual diagram articulating the potential influences that sub-county LE estimates may have on various partners who play a role in improving population health, and suggest some future avenues that may increase the use of sub-county LE estimates.

2.0 Status of SCALE Participant Efforts
The pathway to taking public health actions based upon the patterns observed in sub-county LE estimates involves many steps, including but not limited to—obtaining the appropriate data to calculate sub-county LE estimates, performing the calculations, and disseminating the estimates to various public health partners internal and external to the health department. Findings from an initial evaluation with Phase I jurisdictions indicated that they were able to calculate sub-county life expectancy\(^3\). We wondered about the extent to which participants (Phase I or Phase II) were able to take the next step – sharing the sub-county LE estimates to inform public health actions. In this section, we present the findings from this inquiry.

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2.1 Method
Our team implemented two main data collection efforts to garner an understanding of the status of SCALE projects within jurisdictions: (1) Interviews with SCALE “strongholds” and (2) Survey of SCALE participants that joined under Phase II. Each data collection effort is described briefly below.

SCALE “Stronghold” Interviews. We extended invitations to 11 individuals from 10 jurisdictions (4 local health departments, 6 state health departments) to participate in a 30-minute telephone interview. All invitees participated in interviews (100% response rate). Jurisdictions eligible for participation were those that started to engage in SCALE during Phase I or Phase II of the project and maintained consistent participation through regular teleconferences, in person meetings, conferences, and trainings. We tailored the interviews to each jurisdiction, however, as part of these interviews, we consistently asked about: (1) Their dissemination efforts (including the status of disseminating sub-county LE estimates and procedures for dissemination more generally in their jurisdiction), (2) How decisions are made about what to analyze within their program/jurisdiction, (3) Thoughts on priority analyses in their jurisdiction that might facilitate greater use of sub-county LE estimates for public health, and (4) Next steps for the SCALE effort.

Phase II Update Survey. Several jurisdictions, beyond those recognized as the “strongholds” above, have participated in SCALE since its inception. We invited 22 jurisdictions that participated substantially initially and then dropped off or engaged in a limited capacity (e.g., joined one or only a few phone calls) with the SCALE project to complete a brief survey via email. Of these invitations, two bounced back due to undeliverable emails and twelve responded (60% response rate). We requested information about whether they were able to obtain relevant data to calculate sub-county LE, the extent to which they were able to engage in calculating LE (unable to start, started but did not complete, completed), and if they were able to disseminate the estimates (internally or externally). We also requested information about challenges they faced during each of these stages. The full survey is provided in Appendix A.

2.2 Findings
As of Summer 2018, 22 of the 32 jurisdictions (69%) that participated in Phase I or Phase II of SCALE provided a status update either through our interview or survey efforts. Five of these jurisdictions disseminated sub-county LE estimates prior to the SCALE project and were engaged in the project with respect to helping define and refine methodology; these jurisdictions typically used the resources developed by SCALE to update their estimates. As seen in Table 1, of the remaining 17 jurisdictions, 11 (65%) were able to acquire data for analyses, calculate sub-county LE, and ultimately disseminate these estimates either internally or externally. Six of these jurisdictions shared their estimates both internally and externally.

Only a small subset of jurisdictions were unable to obtain relevant data or complete the calculations once they started. Two jurisdictions did not provide a status update as they either reported not attending any of the SCALE calls (n=1) or they did not continue participating due to increased workloads (n=1). A third jurisdiction reported no updates since a prior interview with the evaluation team in February 2016 at which time they were working to acquire data in an appropriate format to geocode.
Table 1. Status of Phase I and II SCALE Participants

<table>
<thead>
<tr>
<th>Stage of development</th>
<th>Freq (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obtaining relevant data ($N=17$)</td>
<td></td>
</tr>
<tr>
<td>Not applicable/unspecified – did not take steps forward</td>
<td>3 (18%)</td>
</tr>
<tr>
<td>Unable to obtain relevant data</td>
<td>1 (6%)</td>
</tr>
<tr>
<td>Obtained some, but not all, relevant data</td>
<td>2 (12%)</td>
</tr>
<tr>
<td>Obtained all relevant data</td>
<td>11 (65%)</td>
</tr>
<tr>
<td>Calculations ($N=13$)</td>
<td></td>
</tr>
<tr>
<td>Unable to start calculations</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Started, but did not complete, calculations</td>
<td>2 (15%)</td>
</tr>
<tr>
<td>Completed calculations</td>
<td>11 (85%)</td>
</tr>
<tr>
<td>Dissemination* ($N=11$)</td>
<td></td>
</tr>
<tr>
<td>Have not shared estimates</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Shared internal to health department</td>
<td>10 (91%)</td>
</tr>
<tr>
<td>Shared with audiences external to health department</td>
<td>7 (64%)</td>
</tr>
</tbody>
</table>

*aTotal is greater than 100% since health departments could share internally and externally.

2.2.1 Factors effecting dissemination

As part of the survey, we asked jurisdictions about the challenges they faced along the journey to dissemination (data acquisition, calculations, dissemination). Respondents were encouraged to provide responses about these challenges whether they were able to successfully complete that step or not. The most frequent comments related to acquiring data concern the ability to obtain data at the census tract level or to the (perhaps unanticipated) high-level of engagement required to gain buy in or understanding to access the appropriate data. When respondents indicated challenges with respect to calculating estimates, the main challenge related to small numbers—including what constitutes a reliable estimate and when to flag or suppress estimates. Few survey respondents provided information regarding challenges they faced with respect to dissemination. Those that published only internally (and provided a response regarding challenges) indicated the internal audience did not see the results as actionable or faced challenges with respect to the reliability of the estimates and upholding the confidentiality given small population sizes. In the latter case, the respondent also raised the potential issue of stigmatizing populations residing in certain census tracts.

During our interviews with states and localities that had participated regularly in the SCALE project we garnered additional feedback about factors that can affect the dissemination of sub-county LE estimates. Interviewees shared various factors that have presented barriers to or slowed the efficiency of disseminating the estimates. One interviewee specifically mentioned that a lack of staff resources presented difficulties in finalizing how they would like to present/display the estimates—as a result, the estimates had not yet been disseminated. For those who were able to disseminate the estimates, they noted that sometimes logistical issues with
information technology processes (e.g., developing content for website, uploading data into relevant portals) delayed (but did not prohibit) dissemination. Another individual noted that deciding upon the target audience for the reports they disseminated affected the efficiency of the dissemination process—such decisions affect the level of technical detail provided which is an important decision to come to agreement upon prior to release. Health departments that had standard procedures in place for disseminating indicators or had leadership sign-off previously on similar documents (including sub-county estimates) noted that they did not experience issues with receiving approval to move forward with dissemination.

One factor that appears to play an important role in dissemination is the health department’s organizational culture, which can manifest at different levels of an organization (e.g., health department overall, departments, programs). In the narratives shared, respondents often noted that after the sub-county LE estimates are produced there is a conversation internally about the why behind disparities in LE between geographic areas. It seems that organizations range in their comfort level related to how certain they need to be about the drivers of LE in their jurisdiction prior to sharing the estimates. Some indicated that decision makers within their jurisdiction were hesitant to disseminate the LE estimates (in part) without indicators of factors that might help to interpret the LE estimates. Another jurisdiction indicated that internally they felt a need to really understand causal associations, including the potential effects of population migration, on the estimates prior to sharing them. In at least one instance, an interviewee suggested that learning from SCALE peers about their dissemination philosophies may help to shift perspectives within their organization about when it is appropriate to disseminate (and the potential benefits of or rationales for sharing estimates) earlier in the process than they otherwise would have. In other words, it may be possible to shift existing organizational culture through sharing lessons learned from other jurisdictions.

Narratives from some jurisdictions indicated a different norm within their organization. These jurisdictions tend to move forward without answering all of the potential “whys” up front. In some of these cases there were indications that it was important to release the estimates so external audiences could be knowledgeable about the disparities at hand and/or to help stimulate conversations with a broader audience. These health departments were often described as having a culture that valued “data democratization” and operating within a context that believes in “fixing inequities.”

2.2.2 Instances of use and thoughts on facilitating use

During the course of interviews with “stronghold” jurisdictions, we requested insights about the level of receptivity the health department did/did not experience when sharing sub-county LE estimates with internal and external partners. We also aimed to learn about any instances of use with which the respondents were aware. Responses regarding the receptivity among audiences to sub-county LE varied extensively. In several cases, interviewees noted that partners were receptive. In these cases, the release of estimates and related indicators (e.g., social determinants of health) appears to have stimulated many questions among the target audiences including the causes of disparities in sub-county LE and how to improve LE.

Some specific instances of use come from the state of Florida. The state representative we interviewed noted several instances of use among local health departments with whom they had shared sub-county LE estimates. For instance, one of these local health departments (Orange...
County) included sub-county LE estimates for Hispanics within a county-level Hispanic health assessment report they produced and published on the web. The state also calculated, mapped, and shared the Economic Hardship Index at a sub-county level along with sub-county LE estimates with Nassau County Health Department. The interviewee expressed that the county contacts were excited by these estimates and started to disseminate them with others. These dissemination efforts led to the estimates being featured on the local news with the message “the average life expectancy varies by as much as 13 years depending on where you live inside the county.” As part of this short report, ties are made to social determinants of health (including the idea of economic hardship) and residents express their reactions to these findings.

In one instance, an interviewee shared that internal partners experienced a lack of receptivity to the sub-county LE estimates. This lack of receptivity appears to be related at least in part to challenges associated with answering the quick follow-up question that emerges when disparities in sub-county LE are witnessed – “what are the drivers?” Additional thoughts on the lukewarm receptivity relate to: (1) the limitations of the data, specifically the timeliness, as this jurisdiction often had to aggregate across time to produce stable estimates and (2) the absence of a formal network of actors at a local level that is often the target audience for taking public health action.

Finally, on several occasions respondents expressed that they did not know whether individuals were making use of the estimates. One respondent noted that they had disseminated the estimates internally through newsletters and externally through web portals and had not received any questions to date. Another interviewee expressed a similar sentiment stating, “I don’t know. I haven’t heard much about it. We put the information out there, sometimes we get a lot of feedback on the data we put out, other times we don’t hear anything or we may only hear a little bit.” A lack of visibility into the web analytics for the portal on which the data was displayed limited the respondent’s ability to ascertain the extent to which audiences may have accessed the estimates.

During interviews with “stronghold” participants, we also inquired about the types of analyses they might like to pursue within their jurisdictions to help people further understand/interpret the sub-county LE estimates (with the intention of driving public health action). Comments about the general directions they would like to pursue fell into three categories, each described briefly below.

1. Analyses that help to further elucidate the “why” behind sub-county LE disparities. Respondents suggested delving into analyses or calculating indicators that provide more information about what is behind the sub-county LE disparities. This arose from a few different directions. The first was decomposing sub-county LE to see what leading causes of death are driving the LE. A second theme under this category included examining what is causing mortality by age category and sub-county area. The former (age group analyses) were mentioned most frequently by respondents. Finally, respondents were frequently interested in examining upstream determinants that may affect sub-county LE (generally). More specific insights around this included combining all areas with low sub-county LE and higher sub-county LE and looking for cause-specific drivers within

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each group (so as to increase numbers). Another suggestion was to examine potential gains in LE by taking out certain causes of death and re-running LE estimates without them.

2. **Calculating LE with different referent age.** Several respondents suggested calculating sub-county LE for another referent age other than birth. Respondents indicated using a referent of middle age could help to provide insights regarding the effects of the current opioid epidemic on declining LE. Others suggested that using a referent in an older age range (e.g., 55 or 65 years) would be helpful to provide insights about disparities that may exist in older populations. This could be particularly useful for states and counties that have a large older-adult population.

3. **Produce other indicators (specific).** There was also a consistent interest across respondents to develop methods for calculating other summary measures of health at a sub-county level. Suggestions included healthy LE and years of life lost. One suggested examining changes over time—such as looking at sub-county LE in 1995 compared to 2000. One upstream determinant was suggested as well—the economic hardship index.

### 3.0 Case Examples: Use of Sub-county LE in Pre-SCALE Projects

As seen in Section 2.2, several jurisdictions that participated in SCALE were able to disseminate the sub-county LE estimates they produced by Summer 2018. Although the estimates were released, given the scope and intent of SCALE, it may be overly ambitious to assume that we would have seen extensive use of these estimates by internal or external partners. This is especially the case given that over the course of the four-year project timeframe jurisdictions engaged in many efforts that preceded dissemination including identifying, refining, and testing methods for calculating sub-county LE in Phase I and subsequently obtaining data, calculating estimates, making decisions about how and what to display, and disseminating estimates. In addition, participating jurisdictions received limited funds during Phase I to support efforts and engaged on a voluntary basis after that time.

Given these observations, the evaluation team opted to look to existing public health efforts that disseminated sub-county LE estimates prior to SCALE in an effort to obtain additional information to answer, *What is the potential public health utility of sub-county life expectancy estimates?* These case examples provide us with information about the type of influence sub-county LE estimates may have—including who may be influenced by this data and the types of actions they may take to facilitate improvements in public health. Representatives from two of these institutions—Public Health Seattle-King County and Shelby County Health Department—formally joined the SCALE project and performed calculations during this time, however, the information documented in the cases presented here largely reflect efforts prior to SCALE. Virginia Commonwealth University (VCU) also serves as a case example. They did not formally join the SCALE effort, however, engaged with the group on several occasions to share insights from their experiences that we document here.

It is important to note that the methods used to generate the cases that follow differ. For all cases we included insights shared by institution representatives in presentations delivered during an in-person SCALE meeting in March 2018 which highlighted the history of several sub-county LE efforts as well as the influence these estimates had in the broader community. In addition, we took efforts to garner additional insights that relate to use from information available on relevant
websites and, in the case of VCU, requested some additional information that was provided in their grant-related reporting. For Public Health Seattle-King County and the Shelby County Health Department, we also analyzed data from the “stronghold” interviews conducted in April/May 2018 for the larger evaluation (please see Section 2.1 for a description of this method).

In the case of Shelby County, we acquired additional data to produce one detailed case regarding sub-county LE utility—as such this constitutes a formal case study. As part of this additional data collection effort, we worked with a point of contact in the Shelby County Health Department to scope and outline a proposed data collection effort. We subsequently developed a tailored description of the case study inquiry and associated data collection strategy which we shared with the leadership of the health department to obtain permission to proceed. With our point of contact we identified partners internal to the health department who could contribute insights about the utility of the sub-county LE estimates developed to date.

We conducted two focus groups via telephone with these internal partners in 2016. Subsequently we worked with one of these internal partners, to identify and invite a purposive sample of external partners with whom sub-county LE estimates had been shared and may, therefore, have made use of the estimates in their work. We conducted one-on-one interviews with three external partners via telephone which lasted between 25 and 50 minutes. Questions asked during interviews with these external partners were tailored based upon the partner context, however generally included lines of questioning concerning – the general background/work of their organization, how they came to engage with the Shelby County Health Department and in what context they became familiar with the sub-county LE estimates, how the organization had made use of the estimates, how the estimates might play a role in the organization’s work in the future, if there were gaps in the organization’s existing knowledge that the estimates filled, any difficulties they encountered in using the sub-county LE estimates in their work, and if they shared the sub-county LE estimates with others.6 We also extended an invitation to participate in an interview to a member of the Shelby media, our request was declined.

3.1 Public Health Seattle-King County
The experience of Seattle-King County, Washington provides several important lessons. First, this case highlights the importance of geographic resolution in improving the validity of population health indicators. Second, it demonstrates the potential influence that facilitating a dialogue with a diverse array of partners about patterns in sub-county LE estimates alongside factors that are understood to affect LE can have in facilitating public health action.

The story of Public Health Seattle-King County (PHSKC) LE begins with observations about the patterns of LE seen in county-level estimates produced by the Institute for Health Metrics and Evaluation (IHME) for the entire United States. The IHME examined LE at birth for each county in the U.S. relative to ten countries with the highest LE (at birth) estimates. King County, WA fared very well in this comparison—their LE was comparable to (if not better than) the 10 best countries (cite). These figures piqued the interest of individuals working within PHSKC—they

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6 These interview discussions (and the focus groups with internal partners) focused on the zip-code level LE estimates provided by Shelby County HD, not the more recent estimates calculated for census tracts which we make mention of in the case study.
knew that there were areas of King County where populations were in good health, but they also recognized the diversity of health outcomes in the county and suspected that the overall county LE estimate of 81.2 years was masking important variation.

Staff at PHSKC set out to examine LE for King County in greater detail. They initially generated estimates by Health Reporting Areas (HRA)—geographic areas larger than zip codes or census tracts that were envisioned as potentially holding more meaning for the public (e.g., city boundaries). LE estimates across the HRAs (where estimates did not need to be suppressed) indicated almost a 10 year difference at the extremes. In an effort to examine potential associations between several social determinants of health and LE, PHSKC generated maps overlaying a subset of indicators from the Behavioral Risk Factor Surveillance Survey (e.g., obesity, uninsured, smoking) at the zip code level with the HRA LE estimates. Differences in geographic units led to overlapping boundaries across indicators and resulted in challenges with making comparisons—though there was clear variation in absolute disparities in social determinants.

Understanding that disparities in social determinants did exist, PHSKC staff performed additional analyses this time at the census tract level. Using the adjusted Chiang II method, epidemiologists calculated LE at birth among King County residents by census tract (Boothe et al., 2018). The resulting estimates (for areas that did not need to be suppressed) highlighted a much larger disparity in LE than had been seen across HRAs—a 25 year difference in LE was observed between census tracts, with the highest LE estimate of 93 years and the lowest estimated at 68 years. PHSKC staff anticipated sharing the results of these census tract LE estimates with audiences outside of the health department and understood that community members would ask several questions about the root causes of such disparities. Coupling their knowledge of the secondary data that exists on social determinants of health in their jurisdiction with what communities might be interested in understanding, they proceeded with calculating indicators of several modifiable risk factors at a census tract level.

At a meeting hosted by the Federal Reserve Bank, PHSKC staff posted several maps around the room that displayed the prevalence of several risk factors (tobacco use, frequent mental distress, adverse childhood experiences, lack of physical activity, obesity, diabetes, and preventable hospitalizations) and LE at the census tract level. Looking across these maps revealed “strikingly similar spatial patterns of disparities” using the County Health Rankings model of population health, PHSKC staff facilitated a rich discussion among attendees that led to the identification of next steps including formalized partnerships and community engagement.

Lesson Learned #1
Geographic aggregation can hide substantial and meaningful differences in life expectancy.

Producing estimates for smaller geographies (census tracts instead of Health Reporting Areas) helped public health professionals in King County to see an additional 15 year gap in LE between areas.

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One such formalized partnership is the Communities of Opportunity which is a “growing movement of partners who believe every community can be a healthy, thriving community—and that equity and racial justice are both necessary and achievable”  

Undertones of the disparities seen in sub-county LE and several social determinants of health in King County are seen in the Communities of Opportunity messaging – “Being housed, healthy, employed, and connected to one’s community are basic human needs. Yet from neighborhood to neighborhood, access to these essentials vary widely. Race, income, and zip code are major predictors of how healthy we are and even how long we will live.”

Exhibit 1. Communities of Opportunity

Since 2014, Communities of Opportunity (COO) has distributed millions of dollars to support community-based solutions to reduce disparities in King County. Funding for these efforts comes from Best Starts for Kids (BSK) and the Seattle Foundation. One effort conducted to date includes the provision of seed-funding (just over $4.5M) for three communities in King County (Rainier Valley, Seatac/Tukwila, and White Center) to support broad partnerships to “strengthen community connections, increase housing, health, and economic equity and reduce displacement of vulnerable communities.” In 2017, COO increased the investment in these three areas by $2.7M with the intention of their efforts serving as a springboard for other communities.

Another COO effort provides funding for policy and systems change initiatives that are designed to address factors that are hypothesized to underlie disparities in health outcomes such as life expectancy. According to the COO website, approximately three rounds of awards have been issued for these initiatives – eleven in 2014 (award range: $50,000 to $125,000), eighteen in 2016 (totaling just over $1.2M), and an additional 27 in 2017 to support “specific policy and systems projects” (17 grants, ranging from $40,000 to $215,000) and to “build community capacity and engage groups traditionally left out of policy and systems change” (10 grants, ranging from $37,000 to $184,720). As an example of one of the systems and policy change projects most recently funded – the Seattle Indian Health Board received $115,000 to facilitate engagement in the state legislation process with the aim of “bring[ing] about concrete improvements in health care access and quality for Native people.” Proposed activities include supporting such efforts through providing data, conducting policy analysis, and sharing input on legislation. An example of a capacity building and engagement grant is the provision of funds to Para Los Niños de Highline ($40,000) to engage low income Latinos who reside in South King County in developing a change campaign – they aim to build community members’ skills through active participation in surveying leaders and facilitating convenings to identify community priorities.

The COO website notes that they are engaging in participatory evaluation efforts to “identify the most salient evaluation questions, plan the evaluation design, select relevant and appropriate performance measures and data collection methods, and gather data and interpret findings.” At this time, the website does not include a specific evaluation plan nor provide specific, detailed evaluative evidence regarding the extent to which the proposed efforts are being implemented nor the extent to which

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11 https://www.coopartnerships.org/
intended results are emerging. However, the mere existence of this initiative makes it clear that extensive investment and support for actions that have the potential to reduce health disparities are present in King County.

Although we suggest that a dialogue about sub-county LE contributed to the formation of partnerships such as the COO, it is important to elucidate in more detail the types of conversations that emerge around LE that facilitate such actions. The following quote highlights the role of sub-county LE and the importance of conversations with communities in stimulating change. In this excerpt from a telephone interview with Amy Laurent of PHSKC she describes the conversations that emerged when LE estimates and the results of follow-up analyses of several social determinants of health were shared with community members in King County.

“...it is always really interesting when you talk with communities because they have a very different lens from the public health department and their thoughts around what impacts health often is wide-ranging. So, for example...the life expectancy data, it translated to the community well – people got it. They were very receptive to that data and understood what it meant. But where we found some of the challenges were places where we typically don’t have very good data in the public health department. Like ‘well, our community is being gentrified...so people had to move out because they can’t afford to live here anymore’ and we didn’t have great data for that, we are still working on trying to figure out some of that displacement and gentrification data. They talked about the economic impact. For example, one community had subsidized housing with a large ethnic population; the apartment owner sold the property and it got redeveloped into luxury apartments that did not have affordable housing. When everybody had to move out, there was this cascading effect on small businesses that catered to the ethnic community, including ethnic clothing and grocery stores. The move disrupted social ties, had an economic impact, and affected the options of what is available in health when you think about what is around a community. One of the other pieces was local access to jobs. Things in King County are getting increasingly expensive so there are the pressures of if you are low-income how do you afford to live in King County. And so people were talking about the importance of minimum wage and increasing base pay so that people can have a living wage. In some cases, we can look at this sort of data at a county or state level but it is really difficult to get down to a city or community level so there were lots of questions that people had that we weren’t really able to get to. But we have continued to work with the community and try to find partners to try and answer some of those questions. We haven’t gotten there yet, but we are still working on it.”
The previous quote connects sub-county LE discussions to initiatives like Communities of Opportunity. The conversation with community members about the possible reasons for disparities in LE identified several risk factors experienced in daily life that are not captured through current public health data and are only modifiable through interventions that include additional community insights and are designed to change systems and policies that foster and sustain inequities in communities. Initiatives like Communities of Opportunity aim to continue these conversations and implement specific interventions that address the systems and policies associated with the risk factors identified by community members (e.g., income, affordable housing, gentrification). This also speaks to the need look across sectors for additional data components and remove data siloes in order to speak to a more holistic view of communities and the individuals within them.

### 3.2 Virginia Commonwealth University

The experience of Virginia Commonwealth University (VCU) and sub-county LE resides within the Center on Society and Health – an academic research center focused on “connecting the dots between social factors and health.”16 Established in 2007 (originally as the VCU Center on Human Needs), the Center has a well-established history in producing and disseminating findings from research that aims to stimulate conversations among decision makers and change agents that can positively impact the health of Americans.17 A review of their website highlights several initiatives that align with the work of SCALE and suggest a history of lessons learned in data presentation to facilitate interest in health disparities and the connections between upstream and downstream determinants.

In 2010, the Center was funded through a sub-award from the Joint Center for Political and Economic Studies to engage in a project known as Place Matters. As part of this project, the Center focused on performing studies in eight areas of the U.S. (Baltimore, MD; Bernalillo County, NM; Boston, MA; Chicago, IL (Cook County); New Orleans, LA (Orleans Parish); Oakland, CA (Alameda County); San Joaquin Valley, CA; and South Delta, MS) to better understand the place-based factors that contribute to health disparities in each of the selected geographic areas. Each report produced as part of this initiative provides census tract or zip code level estimates of LE18.

More recently, the Center has produced several products that emphasize sub-county LE when making connections between health and social determinants. The dissemination efforts in place to share findings related to analyses of sub-county LE draw upon communication principles that

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16 [www.societyhealth.vcu.edu](http://www.societyhealth.vcu.edu)
17 [https://societyhealth.vcu.edu/about/](https://societyhealth.vcu.edu/about/)
18 [https://societyhealth.vcu.edu/work/the-projects/place-matters.html](https://societyhealth.vcu.edu/work/the-projects/place-matters.html)
aim to promote uptake and use by intended audiences. For example, having a strategy for the communications, ensuring that the communications have local relevance, and sharing the results at a glance in a way that is easy to understand and speaks directly to the intended target audience\textsuperscript{19}.

One report recently published by the Center, \textit{Getting Ahead: The Uneven Opportunity Landscape in Northern Virginia (2017)}, highlighted disparities in LE in several formats including a static report, 2-page fact sheets for specific jurisdictions, an interactive online map, and a press release. Their news release sums up the findings succinctly into “Islands of Disadvantage” in Northern VA. With funding from the Robert Wood Johnson Foundation (RWJF), between April 2014 and September 2016 the Center developed and disseminated life expectancy maps for 21 areas throughout the U.S. These maps display sub-county LE along geographic landmarks familiar to local audiences such as major highways and subway stops (See Figure 1).

\textbf{Figure 1. VCU Life Expectancy Maps for Richmond, VA and New York City, NY}

\begin{figure}
\centering
\includegraphics[width=\textwidth]{life_expectancy_maps.png}
\caption{VCU Life Expectancy Maps for Richmond, VA and New York City, NY}
\end{figure}

\textsuperscript{19} Chapman, D. (March 2018). \textit{The Use of Design in Communicating Scientific Findings}. Presentation at annual SCALE Meeting.
Findings from the Center’s recent sub-county LE efforts have received substantial media attention – on a local and national scale. For example, a brief Google Search using the search term “islands of disadvantage” yields several articles referencing the Center’s report across several media outlets (including but not limited to: The Daily Wrag, WTOP, ARLnow, and the Fairfax County Times) as well as other ancillary websites including a legal website (Lee Legal) and blogs. Media outlets in cities outside of Virginia have also highlighted the disparities seen in sub-county LE calculations from the Center. In April 2015, the New York Times highlighted disparities across New York City, Chicago, Atlanta, and Richmond. A year later, the Philadelphia Inquirer published an article entitled “In Philly your zip code sets your life expectancy” while the Miami Herald echoed similar sentiments (“In Miami, babies born a few miles apart face 15-year gap in life expectancy”). Grant-related documents note that as of 2016, the RWJF-funded LE maps received extensive media coverage with “over 100 stories about the maps released in the project on websites, newspaper, radio, and television news.”

The message of disparities in sub-county LE also gained the attention of policymakers. For instance, U.S. Senator Bernie Sanders posted a link to a Washington Post article highlighting the Center’s LE maps for Washington, D.C. on his Facebook page. The newly elected governor of Virginia, Ralph Northam, specifically referenced the disparities in LE displayed on the Center’s Richmond, VA maps in his inaugural address, “Here in our capital city, a child born two miles that way can expect to live to about age 63. But a child born five miles in that direction can expect to live 20 years longer. You don’t have to be a doctor to know that something’s wrong. The solutions to these problems are not easy. But we do know what they are.”

The Center also reports receiving numerous requests from local, state, and national public health entities (including SCALE) with requests for information on how to calculate small-area LE estimates. The high-level of interest among public health professionals is also demonstrated through the inclusion of the Center’s work at major public health conferences in plenary sessions (i.e., American Public Health Association, Council of State and Territorial Epidemiologists).

Lesson Learned #3
Aligning with solid design and communication principles can facilitate increasing awareness.

Messaging from VCU’s Center on Society and Health on sub-county life expectancy has engendered significant media attention. They have clear strategies for their communications and tailor their communications to increase their relevance and understandability.

https://wtop.com/virginia/2018/01/transcript-ralph-northams-inaugural-address/
Although not formally evaluated for use, the uptake and dissemination of messages through the media alone about small-area LE disparities has reached a large audience. The Center notes that the New York Times article referenced earlier reached over six million individuals. Spreading of these messages by high-level political figures also extends this reach. As noted by the Center, “…these maps have found their way into keynote speeches, high-level policy meetings, Congressional hearings, and other venues – such that we can no longer keep track of how broadly the maps are being used.” This data strongly suggests that the awareness among several audiences (e.g., public, policymakers) regarding the existence of disparities in life expectancy was certainly raised. However, the length of time this awareness was retained by the audiences, how they interpreted the messages delivered, and whether they took any specific actions on such messages remains a question for further inquiry.

3.3 Shelby County Health Department, Tennessee
Shelby County’s experience highlights the important role sub-county LE estimates play in clarifying the impact of social determinants of health and supporting advocacy for policy change in complex, multi-actor environments through open access to public health data. Representatives of the Health Department joined the SCALE project following pioneering work in small-area estimators that arose in response to public health information needs related to county level analyses of chronic disease burden using various hospital utilization and demographic datasets. Understanding of the need to efficiently focus efforts within populations most impacted by chronic disease guided inquiry into small-area estimates of morbidity and mortality, while subpopulation analyses by race, gender, and other demographics rounded out the picture. Looking at LE at the sub-county level was a natural extension of years-long investigations into the differential patterns of health conditions at the zip code level. Sub-county LE estimates provided an important bottom-line by clarifying the impact in years of life lost to social determinants of health.

3.3.1 Context
Public health work in Shelby County is accomplished by a network of actors that includes, but is not necessarily coordinated by, the Shelby County Health Department. Thus, successful dissemination outside the health department is a critical step in Shelby County. Generally speaking, developing and delivering public health interventions in this context involves a loose affiliation of public and private sector organizations, working in coordination on shared goals, through cooperative efforts such as Healthy Shelby, the Let’s Change Coalition, and the Mobilizing for Action through Planning and Partnership (MAPP) process.

The Health Department identified the MAPP process as a helpful framework to support coordinated public health efforts. The MAPP process began in December of 2012. Specifically, MAPP is a highly structured strategic framework developed by the CDC and the National Association of County and City Health Officials (NACCHO) that is designed to support public health assessment and planning among a network of actors. Although they do not specifically reference calculating small-area estimates, the MAPP framework encompasses six phases, each of which has natural connections to small-area statistics: (1) Organize and Develop Partnerships

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(2) Visioning, (3) Four Assessments\textsuperscript{22}, (4) Identify Strategic Issues, (5) Formulate Goals and Strategies, and (6) Action Cycle.

Although the materials provided to support the assessments that comprise the third phase of the MAPP process do not include tools or methodologies for calculating sub-county LE estimates (or any other sub-county estimates), the Health Department understood that two of these assessments (Community Health Status and Community Themes and Strengths) encourage increased visibility into the state of the public’s health in Shelby County at a granular level. The Health Department determined that this need would be best met by working to develop an understanding of the health context through the inclusion of sub-county data.

3.3.2 Sub-county analysis
Coalition members (including staff of the Health Department), understood from looking at their community and from examining the relationship between race, poverty, and illness, that performing analyses of health and related risk factors at sub-county levels had the potential to reveal existing inequality. The Health Department initially selected zip codes as their small area. Although parts of the county likely had populations large enough to produce stable estimates at smaller geographic units, such as census tracts, a policy interpretation related to privacy and size of the denominator made by a data-steward originally dictated they work at the zip code, or in some cases, larger areas.

Individuals who we spoke with at the Health Department indicated that they spent approximately a year obtaining various data sets and preparing them for analysis. They initially obtained data about hospital discharges, emergency room utilization, vital records, as well as data from the Centers for Medicare and Medicaid (CMS), Environmental Systems Research Institute (ESRI), and the Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE). They also accessed data related to social determinants of health, including geographic data (e.g., density of grocery stores, access to transportation), health insurance access, crime rates, high school graduation rates, and other risk factors such as tobacco use, obesity, teenage pregnancy, and pre-pregnancy obesity. Based on an understanding of the literature, and the underlying causal mechanisms, they explored correlations among variables in several of these datasets to identify patterns in health outcomes and related risk/protective factors.

\textsuperscript{22} These four assessments include: Community themes and strengths assessment, local public health assessment, community health status assessment, and forces of change assessment
In their context, zip codes represented a level of resolution that was sufficient to demonstrate marked differences in health outcomes and supported making comparisons across different types of small-area estimates. When possible, they worked at the zip code level. Generating estimates stratified by other variables of importance such as gender or cause of death, substantially reduced the size of the denominator—leading to larger standard errors. When this occurred, the Health Department had to aggregate data to a larger geographic area (or across a longer timeframe).

Their sub-county analyses revealed, as many expected it would, high correlations between race, poverty, lack of access to health insurance, tobacco use, lack of access to healthy food, increased morbidity from cancers and cardiac events, and disparities in LE. As described by one Health Department staff member, analyses performed at this fine level of resolution across multiple indicators of health and social determinants highlight important patterns that provide a narrative about population health…

“you see high cancer mortality rates in the areas of the county where people have low health insurance access and high poverty and you don’t see that in the areas of wealth and high levels of private insurance access. What you’re really looking at is the distribution of access to primary care and cancer screening and early diagnosis and treatment, versus I don’t have a medical home because I don’t have a doctor, because I don’t have health insurance and so I don’t show up until..., in the medical system until I’m symptomatic with stage four cancer and I die.”

3.3.3 Dissemination and use
The Health Department mapped the results of their analyses that examined many indicators of health (e.g., infant mortality, pre-pregnancy obesity, low birthweight, teen birth rates, hospital utilization, emergency department visits, hospital inpatient visits and mortality (diabetes, stroke, cancer, heart disease), health behavior (e.g., percentage of adult pack/day smokers, cigarette sales), social determinants (e.g., percentage of population without a high school degree or GED, percent of population below poverty level, percent of population with health insurance coverage, food access—full service grocery store within one mile, crime rates, percent unemployment), and LE at the zip code level. They subsequently began disseminating these maps within the Health Department and among community partners. Dissemination occurred through a number of channels, within the Health Department, with public health networks (including business and community partners), and more broadly as a result of media engagement.

Health Department. Within the Health Department leadership, the reception was generally positive. Our focus group discussions suggest that they found the sub-county LE estimates and related indicators credible and timely, and perceived it as potentially useful, noting it confirmed

Lesson Learned #4
Although finer levels of geographic resolution are desired, zip code-level findings can provide meaningful insights.

Marked differences in LE, social determinants, and other health and risk factor indicators was detected through zip code level analyses. As such, jurisdictions with zip code level access may be well served by moving forward with analyses while moving towards finer resolution when possible.

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their informed understanding of the state of public health in Shelby County, including areas where the population is at greater risk for adverse health outcomes. Participants indicated that generally managers in the health department were aware of the sub-county LE estimates. Furthermore, they noted that the topic often comes up in connection with other work – for example, during discussions related to causes of infant mortality or teen pregnancy, suggesting that the idea of small area estimates, social determinants of health, and sub-county LE are well accepted and integrated into their work.

As described later, Health Department staff purposefully integrated sub-county LE estimates and related work on social determinants of health into their messaging with several partners. Examples include, but are not limited to, the Let’s Change Summit which is a forum for educating community partners on healthy living and communities of practice within the MAPP process. Health Department staff with whom we spoke, summarized the reaction of partners to the sub-county LE estimates as follows:

1. Appreciation and confirmation – They noted that individuals are able to pinpoint what communities may have low LE but do not know this with certainty. They found that people appreciated having data attached to their assumptions.

2. Clarity – They noted that there is a sense of clarity and connection that comes from increasing the understanding about how many issues occur within the same zip codes. Collaborators discussing obesity and infant mortality may have their discussions apart from each other – but the data enables them to make connections towards common causes.

Individuals with whom we spoke relayed that sub-county LE estimates were used for more than educational purposes – they directly informed program planning. For instance, with respect to smoking cessation—program planners took into account areas where sub-county LE was low and cigarette sales were high in making decisions about focusing their efforts. Participants suggested that some of the interventions included in these plans have been successful in reducing tobacco sales in certain zip codes. Additionally, public health staff noted that sub-county LE estimates directly contributed to their identification of ten zip codes within which they planned to perform community health assessments. To get a better understanding of the health status and contributing factors within these zip codes—Health Department staff identified those zip codes with the highest and lowest sub-county LE estimates for inclusion.

In addition to reflections of times sub-county LE estimates were useful, leaders expressed hope that policymakers might be more receptive to addressing known health inequity when presented with maps of sub-county LE. Such visions appear to have become reality given the 2018 campaign messaging of Lee Harris, the new Shelby County Mayor, who directly cited zip code level LE estimates (see section below entitled “Broader community – media, advocates, and politicians” for inclusion.

Lesson Learned #5
Presentation of sub-county LE and related indicators through mapping may be an ideal mode of communication.

The uptake of messages related to disparities in LE within the media and partnership dialogue appears to have been rapid. This was likely due, in part, to personal identifications with small areas depicted on the maps. Such identification could naturally result in dialogue exploring interrelationships between disparities in mortality and social inequity.
Health Department staff indicated that they are continually encouraging use of sub-county level estimates within the policy community, while noting the success of media and other outside channels in bringing issues to the attention of politicians.

External partners with a public health focus. Dissemination outside the Health Department was particularly important in Shelby County since, as described earlier, much of the work of public health there is done in partnership. Dissemination of sub-county LE estimates occurred in different forums (e.g., web-based, face-to-face).

Shelby County was systematic about releasing sub-county estimates to the web. In addition to publishing sub-county LE estimates on their website, the Health Department contacted the Community Foundation of Greater Memphis (CFGM) for support. The CFGM is a long-established foundation that manages hundreds of millions of dollars in assets, granting a portion of these funds (last year, $178.5 million) to thousands of nonprofit organizations to improve well-being in west Tennessee, eastern Arkansas, and northern Mississippi. In addition to sustaining a diverse set of partnerships with county government, they are active in grantmaking in Shelby County, and offer resources to connect private (in many cases individual) benefactors with programs serving the local community. Of particular importance to dissemination efforts, they house and maintain WhereweLivemidsouth.org—an open-source data portal for geographic health data.

The CFGM became involved with sub-county LE when Health Department personnel reached out to them as part of their dissemination efforts. The Community Foundation noted that their website is well known to those engaged in charitable work in Shelby County and elaborated that two of their funders/donors use the data provided on wherewelivemidsouth.org to identify areas of need and to verify burden information received in grant applications. They noted increasing public access to data that can detect health disparities as a goal they share with the Health Department and stated during our conversations that their intention was to remain involved in sub-county LE dissemination efforts. At the time of our interview in 2016, they noted that the zip code level LE estimates provided by the Health Department were “in a staging area” and would be live on their website “soon.” As such, this partner did not have additional insights to share about the extent to, or the ways in which, users of their open-source data portal made use of the sub-county LE estimates. A recent visit to wherewelivemidsouth.org (November 2018), indicates that the foundation may have reviewed the work of Shelby County (e.g., outputs, references, methodology) and replicated their work, as sub-county LE estimates are now available on their website for the public (Figure 2).25

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24 https://www.cfgm.org/about/
25 http://wherewelivemidsouth.org/#ms:0:a592e3
Health Department personnel also disseminated sub-county LE estimates and related information through presentations at Common Table Health Alliance and Healthy Shelby functions, as well as through the Community of Practice (CoP) groups developed as part of the MAPP process. These CoPs, in particular the Health Disparities and Social Determinants of Health group, provide forums for discussing issues of social justice and therefore provided a space in which to share health indicators related to social determinants of health. Many of the actors engaged in promoting health in Shelby County are involved in these discussions including academic institutions, government, social and health agencies, community associations, hospital systems, and public school systems\(^\text{26}\). The subject also gained exposure through inclusion in additional presentations. For example, the Let’s Change initiative, a Common Table Health Alliance partnership focused on reducing obesity\(^\text{27}\), is key to improving LE and was a natural place to make a connection. Eventually the issue attracted media attention. Collectively, these channels fed back into the political dialogue in Shelby County.

One group that showed an active interest in sub-county LE estimates was Church Health—a large, faith-based, healthcare outreach organization. Church Health provides services based on a wholistic health model, the Model for Healthy Living, which emphasizes a need for balance among themes of faith, friends and family, nutrition, emotion, work, movement, and medical care within a person’s life\(^\text{28}\). Church Health provides clinic and home visit care, has a function that is similar to that of a “health plan provider”, operates a charter pre-school, and manages direct outreach. They also have a significant training mission, which they report has benefited from contact with Health Department personnel.

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\(^\text{28}\) [http://chreader.org/model-healthy-living/](http://chreader.org/model-healthy-living/)
Church Health has long conducted outreach in the communities identified by the Health Department as impacted by social determinants of health, especially in terms of LE. They note that participation in the CoP helped them build a relationship with the Health Department, which led to their learning about sub-county LE estimates. Through interactive dialogue with Health Department personnel, they learned about the information available to guide service delivery planning as well as the relationship between social determinants, the burden of disease, and years of life lost. Through dialogue with Health Department personnel, Church Health staff came to see the value in the use of small area estimates, including sub-county LE estimates, to identify community need and guide programming.

Present during some of these discussions were Church Health Scholars. The Scholars program at Church Health is open to recent college graduates with an interest in healthcare careers—including medicine and public health—who are not presently enrolled in graduate school. These future leaders and future healthcare practitioners engage in a year-long training program that blends academic theory, theology, and personal reflection in a service-learning context. Training is a core mission of Church Health, and the rapid uptake of a message about the importance of the effects of social determinants of health and their relevance to policy and service delivery among future Church Health leadership brings the potential that these scholars will consider health disparities and contributing factors in their future professional practice.

Health Department dissemination efforts reached the business community through the efforts of the Memphis Business Group on Health (MBGOH), a small organization that aims to improve worker health through educating leaders in the local business community. MBGOH became aware of sub-county LE and other small area estimates disseminated by the Health Department at the CoP meetings and through their engagement in other coalitions. While the MBGOH has demonstrated enthusiasm related to sub-county LE estimates, the representative we spoke with indicated that within the business community itself, the reception was lukewarm.

Generally business leaders who spoke with MBGOH about sub-county LE perceived the data as trustworthy, and the need as real. While some business leaders failed to see the relevance of these data to their role in the community, others indicated they see value in using this information to target general philanthropic efforts. The interviewee noted that one company with which s/he spoke has considered the potential impact on providing access to healthy food in the workplace. Other congruencies noted include using social determinants of health to identify where to target marketing efforts around lending products and to improve public relations / image management through community outreach with the end goal of attracting and retaining skilled workers through investment in their communities. It is unclear from the information obtained, the specific connections business representatives envisioned between increased consumption of lending products, or increased positive attitudes towards an employer, with increased life-span. Potential decrease of employer- or employee-paid health insurance premiums through improved worker health was not reported as a potential goal of businesses.

29 https://churchhealth.org/scholars-program-description/
30 http://www.memphisbusinessgroup.org
Broader community – media, advocates, and politicians. The sub-county LE estimates calculated by the Health Department also gained visibility through media, advocates, and politicians. In February of 2016, The Commercial Appeal, a local newspaper owned by USA Today, ran an article that drew attention to the difference in LE between Shelby County zip codes31. In addition to noting the disparity, the article provided a forum for Health Department personnel to provide some context and explanation for the findings. In October 2018, following the election season, The Commercial Appeal ran a series of articles (reporting and opinion pieces) addressing social determinants and sub-county LE. Beyond reiterating the message from 2016—social determinants of health result in the loss of an average of more than 10 years of life across zip codes in Shelby County32—the articles provided a platform for the Health Department as well as several of the partners whom Health Department representatives specifically mentioned (e.g., Church Health, local churches, Common Table Health Alliance, United Way) to speak to this issue.

In addition to the voice of partner organizations, the Commercial Appeal articles also highlighted the voice of some community members—indicating a level of awareness among County residents about disparate LE. For instance, one article highlights the concerns of a Shelby County resident, Durrell Brown, who at 49 years of age “fears he is destined to die young” as a result of a decade-long battle with diabetes which he attributes to “not eating right”. The article connects this to several social determinants of health—the lack of neighborhood grocery stores, access to health insurance and health care33. Health department representatives also indicated an awareness, and advocacy, among residents after hearing about disparities in LE. For instance, following the publication of sub-county LE maps and dissemination in several forums, one resident printed out a map showing the differences in LE between Shelby County zip codes and posted it to physical locations throughout the county with an attached message – “Why is this okay?”

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Lesson Learned #6
Sub-county life expectancy appears to resonate with multiple communities that play an important role in the broader systems that affect public health.

Dissemination of estimates and associated indicators of health and social determinants present a compelling and meaningful story not only among persons who regularly engage in public health activities, but also among those who influence public opinion.

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Local politicians also demonstrated interest in sub-county LE and social determinants of health—including the previous mayor of Shelby County (Mark Luttrell, 2010-2018), the current mayor (Lee Harris), and some county commissioners. The former mayor and at least one county commissioner, indicated this interest by reaching out to the Health Department to obtain additional information about the potential impact of social determinants of health in their jurisdictions. The current elected Mayor of Shelby County, Lee Harris, ran on a platform of social equality that explicitly referenced LE by zip code—

“In the wealthier zip codes in our community, the life expectancy is as much as 82 years, compared to 69 years in lower-income zip codes. To stay healthy, our citizens need access to healthy goods, safe communities, and reliable transit to get to a doctor when needed. If elected Mayor of Shelby County, Lee Harris will take several actions, including launching a new program to promote healthy behavior. We will harness county assets, like the county health department, and the variety of healthy lifestyle efforts already in operation in our county. They will be identified, strengthened and coordinated to form the core of ‘Shelby Fit.’” ~ Lee Harris for County Mayor

The newly elected mayor’s campaign message was embedded with nine other platform items addressing social determinants of health and quality of life for Shelby County residents34.

3.3.4. Current state and conclusions
In the case of Shelby County, dialogue about sub-county LE estimates was a natural outgrowth of the introduction of the estimates into an already healthy (if under-resourced) coalition of actors in the public health space. Additionally, the extent of the disparity in sub-county LE was amplified by the news media and was highlighted in election politics.

As of this writing, the Health Department has started calculating LE at the census tract level. Generally, their findings are consistent with earlier results. However, they note greater disparity among some of the census tracts that were populous enough to support calculating the estimate, and indicate that they expect the findings will be useful if considered thoughtfully in the context of other indicators of health and social determinants.

Sub-county LE work within Shelby County was the inevitable result of looking thoughtfully at data that revealed the state of the public’s health—it is apparent that such sub-county analyses have become a part of this county’s standard public health practice. A focus on thoughtful dissemination among engaged stakeholders was rewarded by rich dialogue. Amplification by the news media and interest among community members and politicians resulted in urgent cries for change. This case suggests that there is a need for small area data, including sub-county LE estimates, among many of the groups active in promoting the nation’s health. Furthermore, the case highlights the extent to which such estimates, particularly when coupled with sub-county analyses of other health indicators and social determinants of health, are used by intended and unintended audiences.

34 https://www.leeharrisformayor.com/platform; https://www.leeharrisformayor.com/extended-platform
4.0 Conclusions
The intention of calculating and disseminating public health indicators from surveillance data is to inform public health action. Public health surveillance is “the ongoing, systematic collection, analysis, and interpretation of health-related data essential to planning, implementation, and evaluation of public health practice.” Given this, an indicator such as sub-county LE, is calculated with the implicit or explicit intention of providing information that will be valuable for taking actions that lead to improved public health. But the route to these public health actions is often unmapped – leaving us to wonder when public health data is getting traction towards impact.

Examples of public health efforts that disseminated sub-county LE estimates (whether prior to SCALE or as part of this effort), provide us with insights about the type of influence these estimates may have—including who may be influenced by this data and the types of actions they may take that facilitate improvements in public health either directly or indirectly. Drawing upon the data gathered through this evaluation we offer Figure 3 as a starting point for considering potential pathways through which calculation and dissemination of sub-county level LE estimates may facilitate public health action to decrease health inequities.

The items depicted on the far left-hand side of Figure 3 include the activities involved in documenting the methods and decision rules associated with calculating sub-county LE estimates as well as several implementation steps that take place (e.g., performing calculations, refining calculations, visualizing, displaying, and messaging) when calculating and disseminating these estimates. The rounded “box” to the right of these activities displays two items: (1) Individuals whose thinking or behaviors may be affected by the sub-county LE estimates (outer dark blue box) and (2) Affective, cognitive, or behavioral changes that are potential precursors to or instances of public health actions given the sub-county LE estimates (inner light blue box).

The case examples shared in Section 3.0, the results of the “stronghold” interviews conducted in Summer 2018, and discussions during the in-person SCALE meeting hosted in March 2018 highlighted several individuals who may be influenced by sub-county LE estimates. These individuals include persons within public health organizations (e.g., health department leadership, program planners and managers, epidemiologists) as well as persons external to such organizations (e.g., partner organizations such as hospitals, churches, nonprofit organizations; community members; activists; media; funders; politicians). These individuals may be intended or unintended end users of the estimates.

The pathway to individuals using sub-county LE estimates to take actions that will improve public health is multifaceted and can be direct or indirect. For instance, program planners within a local health department may elect to expend resources in sub-county areas where LE estimates are low relative to other areas—an instance of direct action. On the other hand, a politician’s awareness of health disparities may result from seeing one or more media reports highlighting sub-county LE estimates. This individual may combine such awareness with other insights and over time elect to allocate funds for programs designed to address systemic inequities – an instance of indirect action that arises first through media channels.

35 https://www.cdc.gov/publichealth101/surveillance.html
Funders are inclusive of current and potential future funders; health department leadership/management is wide ranging and can include individuals such as the health director, health officer, health commissioner, the board of supervisors, the state epidemiologist, the chief of epidemiology; public health partners outside of health departments include but are not limited to hospitals, private sector partners (e.g., social entrepreneurs), non-profit organizations, community-based organizations, churches, and activists; Politicians are inclusive of policymakers at many levels including, but not limited to, national and state legislators, governors, mayors, city council members.
The data gathered through this evaluation highlight some potentially important avenues that public health practitioners can take to increase the potential of public health action occurring via indirect or direct routes. These results suggest that public health practitioners need to consider the various pathways to public health action in advance and take *systematic, purposeful, and planful* steps towards introducing the results of sub-county LE estimates and related analyses to individuals who participate in this change process.

1. **Identify and make use of existing best practices for promoting uptake and use**
   Much is known about how to promote effective uptake and use of evidence among an array of audiences. In the case of Virginia Commonwealth University, public health practitioners employed communication design principles in disseminating their findings. Though we cannot say empirically that such actions resulted in the significant uptake by media outlets, it is reasonable to suggest that such principle-driven actions contributed. In addition to communication principles, there is a wealth of empirical literature available about how to facilitate *use* of evidence among a variety of audiences. One facilitating factor highlighted in this literature includes involving potential end-users early to identify their information needs and what is important/meaningful to them. Data gathered through the “stronghold” interviews indicates that decisions about what data analyses to perform is commonly the result of funder requests/mandates, internal discussions with leadership or related public health programs, or an emergent process that evolves from analysts seeking deeper insights based upon earlier analytic findings. In some instances, input from community partners, local health departments, and/or data requests inform analytic decisions. These findings suggest that there is room for engaging potential end-users of sub-county analyses earlier in the process which may facilitate greater uptake and use.

2. **Consider where direct action happens and engage in meaningful dialogue about results**
   Information from this evaluation suggests that the likelihood of public health actions occurring after epidemiologist share sub-county LE estimates and associated analyses increases when the public health department takes specific, targeted actions to discuss the findings with individuals who are most likely to implement public health interventions. Public health action often occurs through local health departments and via community organizations/partnerships. SCALE participants from Florida took specific and intentional efforts to connect with a subset of their local health departments to share and discuss the results of the sub-county LE estimates and related analyses. As seen in Section 2.2.2, at least two local health jurisdictions made progress on the path to public health action through sharing the sub-county LE estimates and related analyses with others. In the case of Public Health Seattle-King County, where extensive discussions with the local community occurred, we see evidence of public health action through the formation, funding, and implementation of interventions through Communities of Opportunity.

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38 Johnson et al., 2009; Alkin & King, 2017
3. **Integrate disparate data/indicators to facilitate dialogue that makes informed connections**

Throughout our conversations with SCALE participants, it was evident that shortly after viewing sub-county LE estimates, public health partners ask “why?” or “what is the cause of these disparities?” or “what can be done about this?” Such questions indicate that coupling sub-county LE estimates with indicators of risk factors, protective factors, and health outcomes can provide potentially beneficial insights about potential public health action areas or stimulate rich dialogue about future actions. Discussions among SCALE participants indicate the importance of indicators being available at the same level of resolution (e.g., all available at zip code or census tract level), which is not always possible. Furthermore, as evidenced in the Seattle-King County case example, data are not always available to calculate indicators that allow for the examination of risk factors raised as potentially important by community partners. Nevertheless, the case examples highlighting the efforts of Shelby and Seattle-King County point to the richness of discussions that can ensue by sharing thoughtful examinations of the existing data with partners and provide examples that other public health departments and institutions may wish to model to help facilitate public health action.

5.0 **Closing Thoughts**

The findings from this evaluation indicate that several participating jurisdictions were able to disseminate the sub-county LE estimates they calculated as part of SCALE—a rather remarkable finding given the limited funding provided for this effort. The extent to which this dissemination has resulted in the changes articulated in Figure 3 among SCALE participants is unknown. However, it is important to note that we intentionally did not set out to examine use among SCALE participants because this seemed to be an unrealistic expectation given the number of activities that SCALE participants were engaged in prior to dissemination, the timeframe for the effort, and the limited funding supporting the effort. Rather we aimed to answer the evaluation question, “What is the potential public health utility of sub-county life expectancy estimates?” by delving into cases that had calculated and disseminated sub-county LE estimates prior to SCALE.

In examining the case examples, it seems apparent that the potential public health utility of sub-county LE estimates is high. However, the route from calculation and dissemination of sub-county LE estimates to public health action is multifaceted and may take some time to come to fruition. Such observations have important consequences for how the public health community might evaluate the “success” of efforts like SCALE. This experience teaches us that public health action may not be the most important consideration in “success” but rather the precursor influences that may gain traction and facilitate (indirectly or directly) public health action.

Additionally, the cases and existing literature regarding evidence use indicate that facilitating public health action requires more than method. One SCALE participant noted, “I’ve just tried to provide the best surveillance data I could and hopefully people would take action.” Empirical examinations of use in the discipline of evaluation indicate that passive consumption of information will not lead to action. Rather the route to action requires active, engaged, and meaningful interaction with the potential end-users to identify their information needs and facilitate dialogue around the findings. We see further evidence of this in the case examples. Such efforts, however, require resources in terms of staff time and funding. Insights from this
evaluation suggest that sub-county LE estimates and related analyses provide information that promotes rich discussion between public health partners. Providing support to public health entities to perform these analyses and engage in systematic, planful, efforts to engage partners in dialogue throughout the process holds strong potential for moving towards public health actions that contribute to reducing health disparities.
Appendix A. Phase II Update Survey

Thank you for participating in the SCALE effort and for agreeing to complete this brief survey. We anticipate the survey taking no longer than 15 minutes to complete. Depending upon the steps taken within your jurisdiction to date to calculate and share sub-county life expectancy estimates you will be asked to complete between three and ten questions. We anticipate presenting results from this survey in aggregate form in the final evaluation report for the SCALE project. If you have any questions about the survey please do not hesitate to reach out to me at: Leslie@FierroConsulting.com.

Section A. Data Acquisition

1. Which of the following best characterizes the extent to which your jurisdiction was able to acquire the data needed to calculate sub-county life expectancy estimates?

<table>
<thead>
<tr>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>We were unable to obtain any of the relevant data</td>
</tr>
<tr>
<td>We obtained some, but not all, relevant data</td>
</tr>
<tr>
<td>We obtained all relevant data</td>
</tr>
</tbody>
</table>

2. In the space below, please describe any challenges you faced in obtaining the relevant data. Please note we are interested in your feedback on this irrespective of the response option you selected in Question 1 above.

If you were able to obtain some or all relevant data, please proceed to Section B on the next page. If you were unable to obtain any relevant data, please skip to Question 7.
**Section B. Calculating sub-county life expectancy**

3. Which of the following best characterizes the extent to which your jurisdiction was able to perform calculations of sub-county life expectancy?

<table>
<thead>
<tr>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>We were unable to start calculations</td>
</tr>
<tr>
<td>We started, but did not complete calculations</td>
</tr>
<tr>
<td>We were able to complete calculations</td>
</tr>
</tbody>
</table>

4. In the space below, please describe any challenges you faced in calculating sub-county life expectancy estimates for your jurisdiction. Please note we are interested in your feedback on this irrespective of the response option you selected in Question 3 above.

*If you were able to complete the calculations of sub-county life expectancy, please proceed to Section C on the next page. If you were unable to complete these calculations, please skip to Question 7.*
Section C. Dissemination of estimates

5. Which of the following best characterizes the extent to which your jurisdiction was able to share/disseminate the sub-county life expectancy estimates you calculated?

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>We have <strong>not</strong> shared/disseminated these estimates internally or externally to the health department (<em>please skip to question 6</em>)</td>
<td></td>
</tr>
<tr>
<td>We have shared/disseminated these estimates either internally or externally to the health department</td>
<td></td>
</tr>
</tbody>
</table>

   a. You indicated that you shared/disseminated the estimates. With whom have you shared the estimates?

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals working within the health department</td>
<td></td>
</tr>
<tr>
<td>Individuals or organizations external to the health department</td>
<td></td>
</tr>
</tbody>
</table>

   b. In the space below, please describe your dissemination efforts to date. We are specifically interested in who you have shared the estimates with and how (e.g., online data portal, in person meetings). Any insights you have on how the estimates were received by these audiences would also be helpful.

   c. Would you be open to having a brief telephone conversation to discuss these dissemination efforts further?

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

6. In the space below please describe any challenges you faced in sharing/distributing the sub-county life expectancy estimates.
Section D. Final Thoughts

7. In the space below, please feel free to share any additional thoughts you have with us regarding the SCALE project or the efforts your jurisdiction has undertaken with respect to sub-county life expectancy.

Thank you for sharing a status update with us regarding your work on sub-county life expectancy. As noted earlier, we anticipate presenting results from this survey in aggregate form in the final evaluation report for the SCALE project. If you have any questions about the survey or the larger evaluation, feel free to reach out to: Leslie@FierroConsulting.com.