



Estimating the Cost of Providing Foundational Public Health Services

Research In Progress Webinar

Wednesday, January 11, 2017

12:00-1:00pm ET/ 9:00-10:00am PT

Funded by the Robert Wood Johnson Foundation

Agenda

Welcome: Rick Ingram, DrPH, Assistant Professor, University of Kentucky College of Public Health

Estimating the Cost of Providing Foundational Public Health Services

Presenter: Cezar B. Mamaril, PhD, Research Assistant Professor, University of Kentucky College of Public Health cbmamaril@uky.edu

Commentary: Phil Huang, MD, MPH, Systems for Action National Advisory Committee Member; Medical Director and Health Authority, Austin/Travis County Health & Human Services Department, TX
Philip.Huang@austintexas.gov

Georgia Heise, DrPH, Public Health Director, Three Rivers District Health Department, KY georgiaf.heise@ky.gov

Questions and Discussion

Presenter



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Systems for Action

Systems and Services Research to Build a Culture of Health



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11 January 2017

Acknowledgements

Systems for Action is a National Program Office of the Robert Wood Johnson Foundation and a collaborative effort of the Center for Public Health Systems and Services Research in the College of Public Health, and the Center for Poverty Research in the Gatton College of Business and Economics, administered by the University of Kentucky, Lexington, KY.

- Robert Wood Johnson Foundation
- The Public Health Activities and Services Tracking (PHAST) Study team at the University of Washington led by PI Betty Bekemeier, PhD, MPH (*RWJF 71472*)
- Public Health Delivery and Cost Study (DACS) team at the University of Washington, and the Washington Public Health PBRN, led by co-PIs Betty Bekemeier, PhD, MPH, and Justin Marlowe, PhD, MPA, MA (*RWJF 71132*)
- Public Health Leadership Forum (PHLF) – ASTHO, NACCHO, PHAB, CDC, RESOLVE
- University of Kentucky research assistance of Keith Branham, Lava Timsina, and Nurlan Kussainov
- Kentucky Health Departments Association (KHDA) and Georgia Heise, DrPH
- Association of Ohio Health Commissioners, Inc. (AOHC) and Terry Allan

Toward a deeper understanding of costs & returns in public health

2012 Institute of Medicine Report* identified two fundamental barriers to improving the nation's public health system

- (1) lack of agreement on a core set of public health capabilities that should be present in every U.S. community
- (2) lack of knowledge about the resources required to implement these capabilities.

The report concludes that sound policy for improving the nation's public health system can move forward only when there is sufficient understanding and agreement about what the public health system should be able to do and how much it will cost.

2012 Institute of Medicine Recommendations

- Called for an expert panel process to identify the components of a “minimum package” of public health services and cross-cutting capabilities that should be available in every U.S. community to protect and improve population health.
- Undertake and expand research to estimate the resources required to implement these services and capabilities universally across the U.S.
- Develop and implement a **national chart of accounts** for tracking spending & flow of funds



Defining What to Cost: The Public Health Package

- Washington State's **Foundational Public Health Services**
- Ohio's Public Health Futures Committee: **Minimum Package of Services**
- Colorado's **Core Public Health Services**



In response to IOM recommendations, RWJF commissioned a national expert panel in 2014 - Public Health Leadership Forum (PHLF)

- PHLF included representatives from federal, state, and local public health agencies, public health professional associations, universities, public health accrediting bodies, and health policy advisory commissions.
- Used available research, practical experience & expert opinion to distinguish two broad types of responsibilities or “actions” within the public health system: (1) categorical programs and policies; and (2) cross-cutting capabilities

Definitions

- The PHLF National Workgroup developed definitions of foundational public health capabilities, specified in the *Public Health Leadership Forum's **Articulation of Foundational Capabilities & Foundational Areas*** (funded by RWJF, facilitated by RESOLVE): <http://www.resolv.org/site-healthleadershipforum/>
- FPHS Categories articulated and defined ([V1](#))

Foundational Areas (FA): substantive areas of expertise or program-specific activities in all state & local health departments essential to protect the community's health.

Foundational Capabilities (FC): Cross-cutting skills that need to be present in state & local health departments [everywhere](#) for the health system to work [anywhere](#). Needed to support the foundational areas, & other programs & activities, key to protecting community health & achieving equitable health outcomes.

Foundational Public Health Services (FPHS): Suite of skills, programs, & activities that must be available in state & local health departments system-wide; includes foundational capabilities & areas.

The FPHS Framework



RESOLVE/Articulation of Definitions Workgroup (as of November 2014)

FPHS CE Data-Collection & Research Effort

- **Workgroup on Foundational Public Health Services (FPHS) Cost Estimation (CE)** convened to develop a methodology for estimating the resources required by governmental public health agencies to implement foundational public health services. Released a report on recommended methodology:

Estimating the Costs of Foundational Public Health Capabilities: A Recommended Methodology

Accessible at http://works.bepress.com/glen_mays/128/

- Pilot-Tested Methodology with KHDA Finance Workgroup comprised of 6 Kentucky Health Departments (June-October 2014)
- Pre-Tested web-based survey questionnaire using FPHS V2 definitions with selected Ohio LHDs from AOHC (February 2015-May 2015).
- Incorporated data from DACS study of Washington PHAST Study Team*

* Source: Bekemeier, B., Marlowe, J, Squires, L.S., & Tebaldi, J. (2016, under review). Perceived need versus current spending: Gaps in providing foundational public health services in communities.

DATA COLLECTION INSTRUMENT: Basic Process Flow

- Adapted & modified FPHS CE data-collection instrument from Washington PHAST Study Team from their Delivery and Cost Study*
- FPHS CE respondent answers survey based on understanding of each FPHS capability and area as defined and articulated.
- Questionnaire is divided into five major sections:
 - 1) LHD **workforce composition** (# of employees per category)
 - 2) LHD **labor resource use** (average hrs/wk per occupational category)
 - 3) **Salary** and fringe benefits (wage rate scale: min-ave-max)
 - 4) Total **Annual Non-Labor** Costs (per FPHS category)
 - 5) **Needs assessment** (current attainment scale relative to full attainment of projected need)

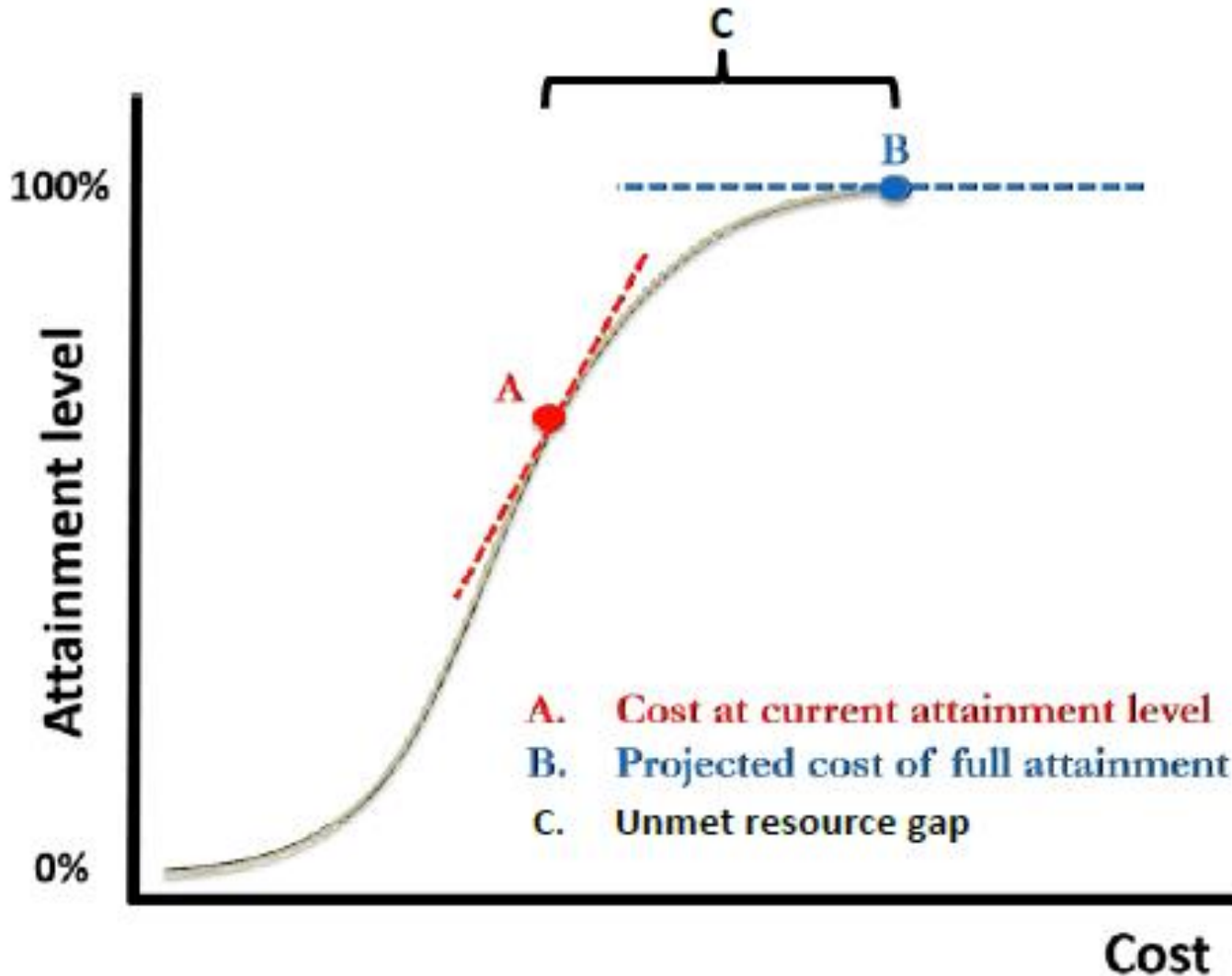
* Source: Bekemeier, B., Marlowe, J, Squires, L.S., & Tebaldi, J. (2016, under review). Perceived need versus current spending: Gaps in providing foundational public health services in communities.

FPHS Definition Example

“Assessment (including Surveillance, Epidemiology, Laboratory Capacity, and Vital Records)”

- Ability to collect sufficient foundational data to develop and maintain electronic information systems to guide public health planning and decision making at the state and local level. Foundational data include Behavioral Risk Factor Surveillance Survey (BRFSS), a youth survey (such as YRBS), and vital records, including the personnel and software and hardware development that enable the collection of foundational data.
- Ability to access, analyze, and use data from (at least) seven specific information sources, including (1) U.S. Census data, (2) vital statistics, (3) notifiable conditions data, (4) certain health care clinical and administrative data sets including available hospital discharge, insurance claims data, and Electronic Health Records (EHRs), (5) BRFSS, (6) nontraditional community and environmental health indicators, such as housing, transportation, walkability/green space, agriculture, labor, and education, and (7) local and state chart of accounts.
- Ability to prioritize and respond to data requests, including vital records, and to translate data into information and reports that are valid, statistically accurate, and accessible to the intended audiences.
- Ability to conduct a community and statewide health assessment and identify health priorities arising from that assessment, including analysis of health disparities.
- Ability to access 24/7 laboratory resources capable of providing rapid detection.”

Conceptual representation of how the expected costs of full FPHS attainment are derived from a current attainment scale



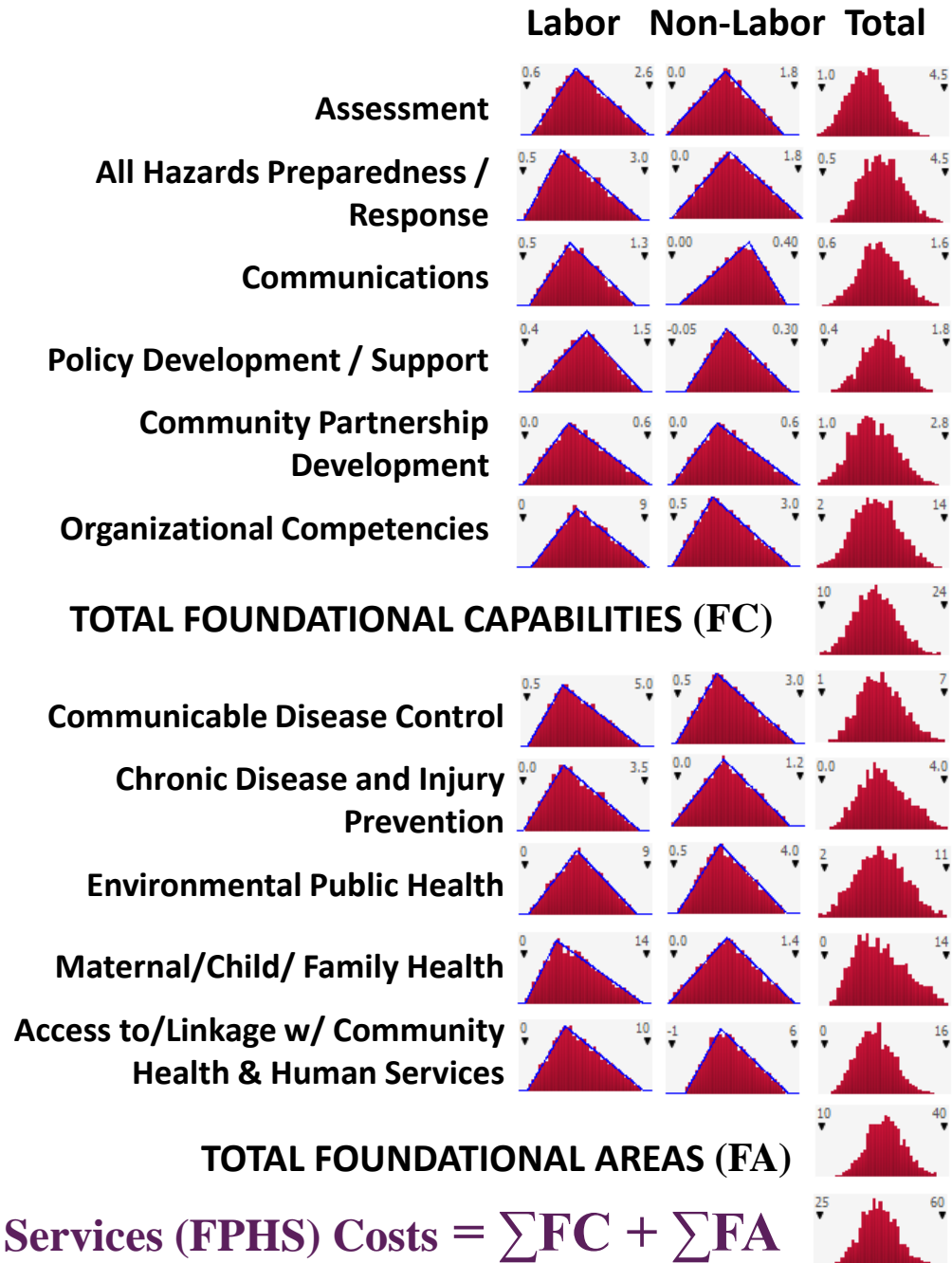
“Based on your understanding of how each public health foundational capability & foundational area is defined, please provide your **global or overall assessment** on the following question: *For each foundational category, what is the estimated percentage currently being met by your health department?* “

Development of FPHS CE Methodology

- Inherent burden of complex survey, goal of efficiently self-administered to capture estimates that account for variation in costs due to the dynamic nature of public health.
- **Pragmatic Empirical approach**: Simulation modelling approach to estimate cost of implementing FPHS by modeling variation (i.e. uncertainty) associated with collected cost data and interpretation of FPHS domain definitions
- Collect data on upper-bound and lower-bound estimates of current resource use for each FPHS and each resource category (labor and non-labor), along with estimates of the most likely resource levels used in their agency.
- Combined to generate probability distributions of costs –range of all possible cost values & the likelihood of their occurrence (versus point estimate).
- Monte Carlo simulation modelling techniques to estimate both within-agency uncertainty and between-agency variation in resource use, separate these two components, and then calculate the most likely levels of resource use.
- Estimate 10,000 iterations of the simulation model using Latin Hypercube Sampling and assuming Program Evaluation and Review Technique (PERT) distributions for all cost parameters.

Illustrating the Model Simulation Approach: Current Per Capita Costs

In summary, the FPHS CE Methodology produces three sets of cost estimates: (1) costs currently incurred by an agency to implement each FPHS element (*current costs*); (2) *expected costs* that would be incurred by the agency to implement each FPHS at full attainment levels; and (3) *unmet resource gap* that is calculated as the difference between expected costs and current costs for each FPHS element.



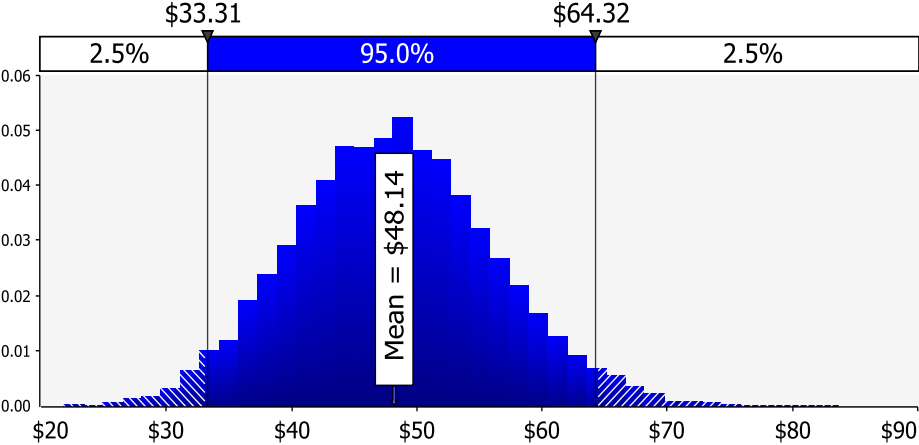
Total Foundational Public Health Services (FPHS) Costs = $\sum FC + \sum FA$

Model Simulation Results

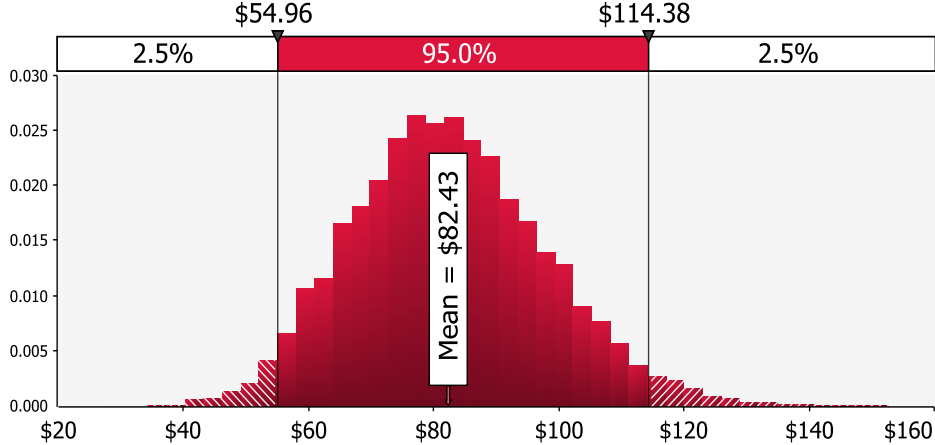
Per capita cost estimates from sample consisting of
9 LHDs from Kentucky & Ohio pilot survey sample and
10 LHDs from Washington PHAST study*

* Source: Bekemeier, B., Marlowe, J, Squires, L.S., & Tebaldi, J. (2016, under review). Perceived need versus current spending: Gaps in providing foundational public health services in communities.

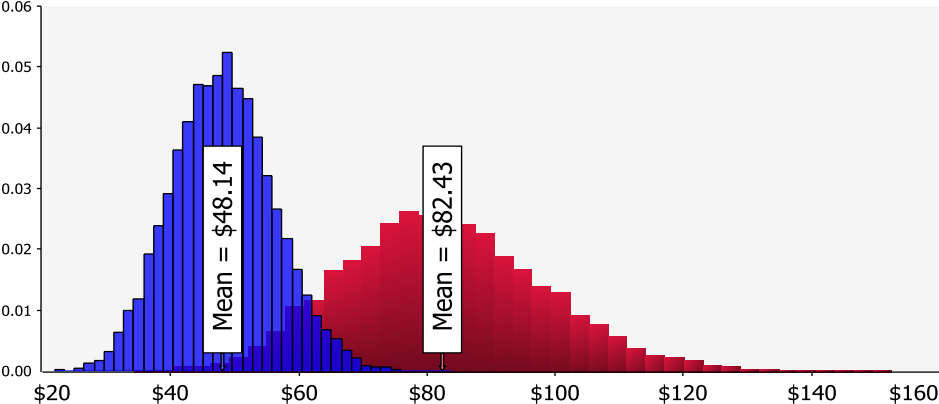
Estimates of Current and Expected Cost Per Capita for Foundational Public Health Services



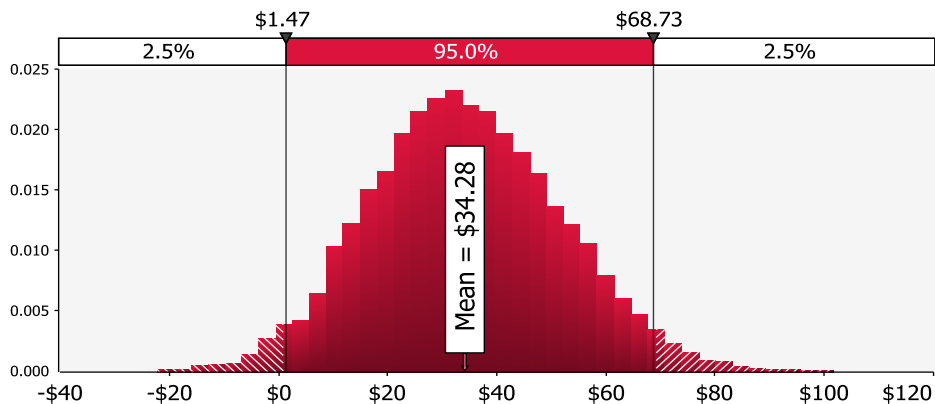
current per capita costs



full attainment per capita costs



graph overlay of current w/ projected need

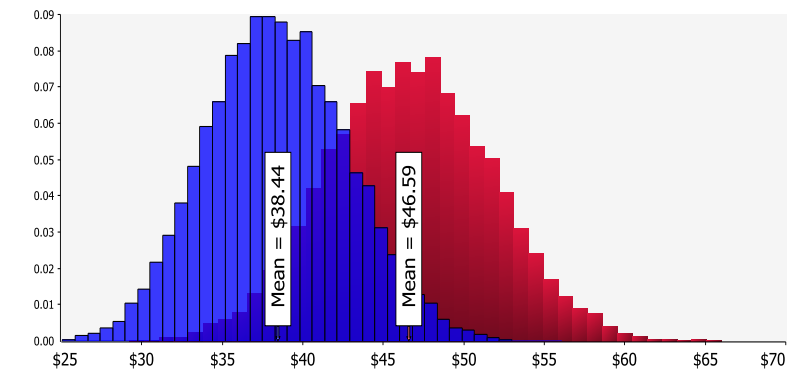
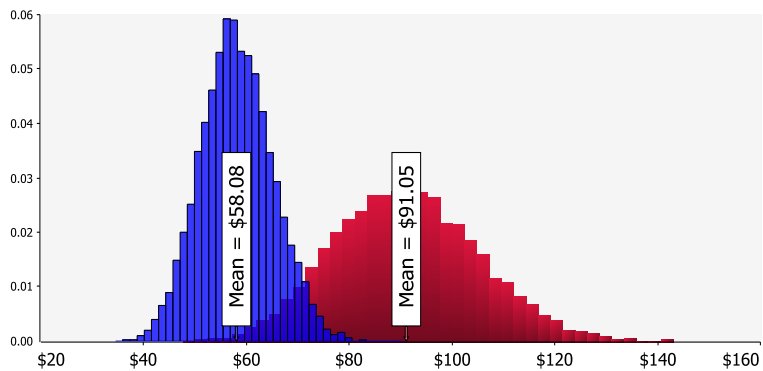
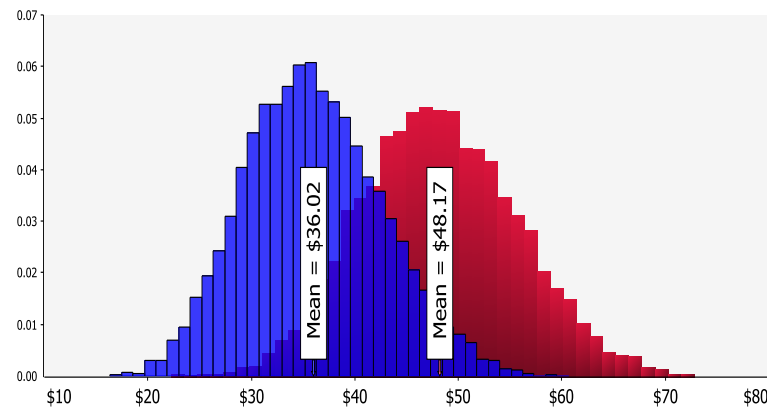
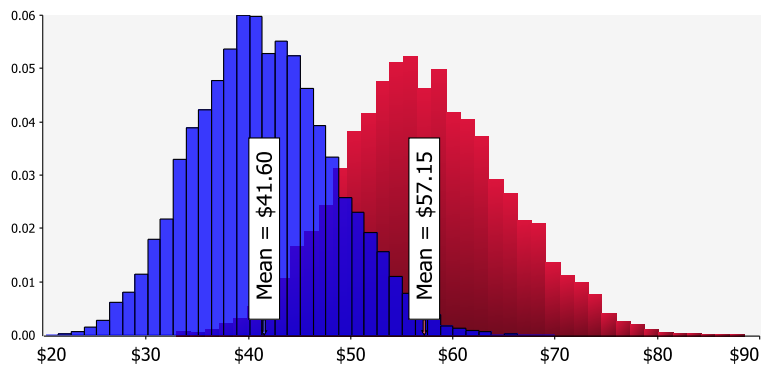
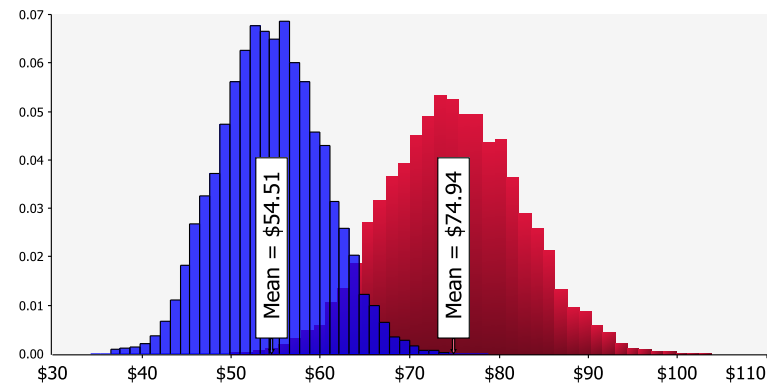
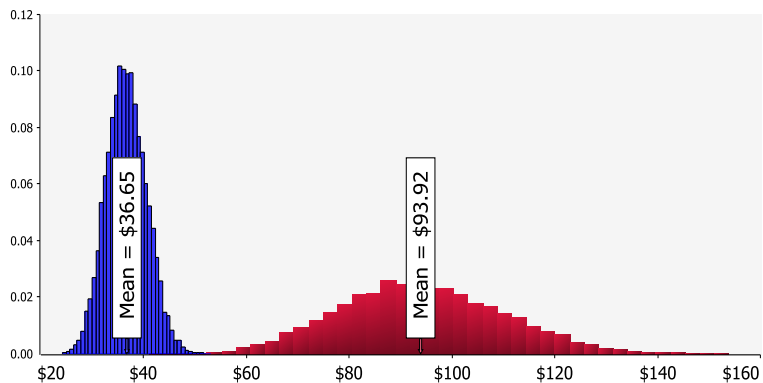


estimated resource gap (per capita costs)

Estimates of Current and Expected Cost Per Capita for Foundational Public Health Services

FPHS Domain	Current Resource Use (\$)				Expected Cost of Full Attainment (\$)			
	Mean	Percentile		Coef. Var.	Mean	Percentile		Coef. Var.
		2.5th	97.5th			2.5th	97.5th	
<i>Foundational Capabilities</i>								
Assessment	1.70	0.32	3.43	49.1%	3.40	0.55	7.28	53.1%
Emergency Preparedness	2.57	0.48	5.33	50.7%	5.47	0.78	12.45	57.5%
Communication	0.63	0.11	1.32	51.3%	0.98	0.20	1.94	47.2%
Policy Development	1.52	0.24	3.27	53.5%	3.21	0.63	6.90	52.4%
Community Partnerships	2.22	0.36	4.77	53.3%	3.85	0.71	8.06	51.2%
Org. Competencies	9.82	3.65	16.18	34.1%	14.91	3.64	29.29	46.1%
Tot. Found. Capabilities	18.46	11.04	26.27	21.7%	31.82	17.20	48.80	25.8%
<i>Foundational Areas</i>								
Communicable Disease	3.40	0.84	6.34	43.3%	5.53	1.36	10.21	42.8%
Chronic Disease	3.30	0.60	6.77	50.1%	6.72	1.23	14.16	51.6%
Environmental	7.49	2.51	14.43	42.7%	10.85	3.66	19.02	37.9%
Maternal Child Health	10.93	2.19	21.71	47.8%	19.08	2.80	41.80	54.9%
Access & Linkage	4.56	0.77	9.58	51.9%	8.42	1.15	18.94	56.8%
Tot. Found. Areas	29.68	17.03	43.66	23.2%	50.60	27.80	78.00	25.5%
TOTAL FPHS	48.14	33.31	64.32	16.4%	82.43	55.00	114.40	18.6%

Using simulation model to examine variation by region and public health jurisdiction size



Limitations of the study

- FPHS elements defined using general terms that leave considerable room for interpretation regarding resource requirements. The lower-bound and upper-bound cost estimates produced by this analysis, representing 2.5% and 97.5% percentiles of the cost distribution, reflect uncertainties that are inherent in the FPHS definitions.
- Diverse cohort of LHDs in the sample represent a limited number of states and communities that may not be fully representative of the nation as a whole
- Estimates reflect resources required to implement FPHS using existing approaches for organizing and implementing public health services at state and community levels. Our model does not reflect economies of scale and scope that may be possible through alternative organizational and implementation strategies.

Results in context...

- If we were to scale per capita resource gap estimates to a national level, results imply full attainment of FPHS recommendations would require an estimated \$34.28 per capita or around \$10.9 billion in additional resources per year (~318 mil. 2014 US Pop).
- Increase state and local government PH activity spending by 16.1% over the levels estimated in the National Health Expenditure Accounts for 2014.
- Alternatively, resource gap could be filled by doubling federal govt spending on PH activities from the \$11.0 billion estimated in 2014.
- Consistent with these estimates, the 2012 IOM report recommended a doubling of the federal government's expenditures for public health activities in order to fund a minimum package of public health services.
- Continued efforts towards collecting data to generate national estimates
 - Uniform Chart of Accounts initiative
(<http://phastdata.org/research/chart-of-accounts>)

Commentary



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Questions and Discussion

Webinar Archives

<http://systemsforaction.org/research-progress-webinars>

Upcoming Webinars

Thursday, January 19, 1-2 pm ET/ 10-11am PT

INTER-ORGANIZATIONAL COLLABORATION IN LOCAL PUBLIC HEALTH SYSTEMS

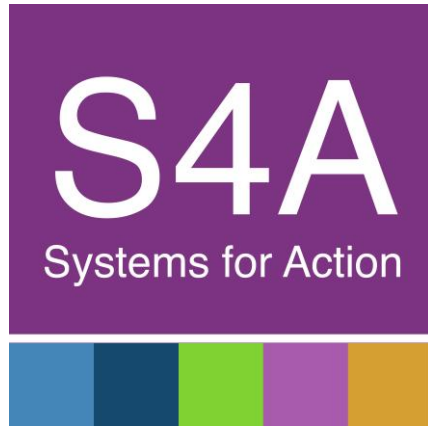
Justin Marlowe, PhD, MPA, and Betty Bekemeier, PhD, MPH, RN, University of Washington

Wednesday, February 8, 12-1pm ET/ 9-10am PT

UNDERSTANDING RURAL-URBAN DIFFERENCES IN THE IMPLEMENTATION OF POPULATION HEALTH ACTIVITIES

Lava Timsina, PhD, MPH, Systems for Action National Coordinating Center, University of Kentucky College of Public Health

Thank you for participating in today's webinar!



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For more information about the webinars, contact:

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Speaker Bios

Cezar Brian (CB) Mamaril, PhD, MS, is a Research Assistant Professor at the RWJF *Systems for Action* National Coordinating Center, University of Kentucky College of Public Health. His research focuses on public health systems financing and economics. CB received his PhD in Public Policy and Administration from the University of Kentucky Martin School of Public Policy and Administration, and a degree in Agricultural and Applied Economics from VirginiaTech University.

Philip Huang, MD, MPH, has served as the Medical Director and Health Authority for Austin Public Health since April 2008. He formerly served as Medical Director for Chronic Disease Prevention at the Texas Department of State Health Services for more than 15 years. Dr. Huang served two years as an Epidemic Intelligence Service (EIS) officer with the Centers for Disease Control and Prevention assigned to the Illinois Department of Public Health where he conducted infectious disease outbreak investigations and epidemiologic studies in chronic disease. He is an author or co-author of numerous publications related to public health, chronic disease, and tobacco use prevention, and is Board Certified in Family Medicine.

Georgia Heise, DrPH is the Director for Three Rivers District Health Department, one of the first health departments in the nation to achieve PHAB accreditation. She serves on the Executive Committee and Legislative Committee for the Kentucky Health Departments Association and chairs both its Strategic Planning Committee and Foundational Capabilities Workgroup. Dr. Heise serves on the Board of Directors and the Legislative Committee for the Kentucky Public Health Association. She is an adjunct faculty member for the University of Kentucky's College of Public Health, and also co-directs the newly established Kentucky Population Health Institute. Beyond Kentucky, Dr. Heise is the Immediate Past President of the National Association of County and City Health Officials (NACCHO). Three Rivers is one of six local health departments in a national pilot study for RESOLVE, an independent non-profit organization funded by RWJF to study Public Health Foundational Capabilities.