

**Identifying & testing a  
minimum data set  
to evaluate public health performance  
with network analysis**

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# Overview

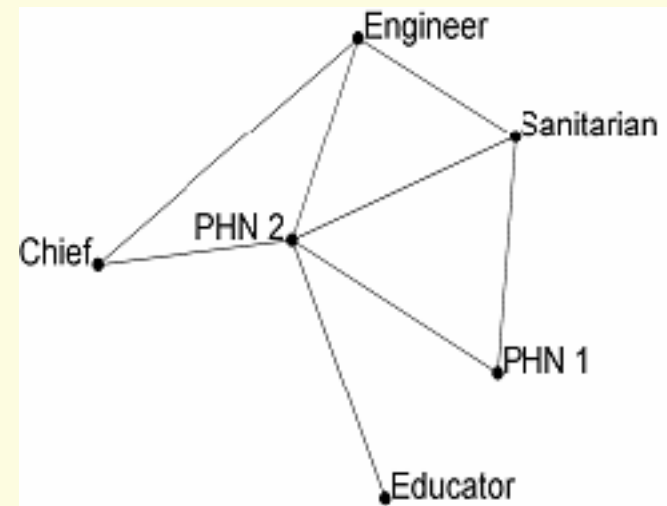
- Background
  - organizational network analysis
  - prior work
- Process to identify a minimum data set
- Results from testing the minimum data set

# Background

## Organizational network analysis

- Different kind of data

	PHN1	San.	PHN2	Educ	Chief	Eng.
PHN1	0	1	0	0	0	0
San.	1	0	1	0	0	0
PHN2	1	1	0	1	1	1
Educ	0	0	1	0	0	0
Chief	0	0	1	0	0	0
Eng.	0	0	1	0	1	0



- Tool for understanding complexity
- Wide application in **private sector business**
- Management tool for public agencies?

# Dynamic Network Analysis



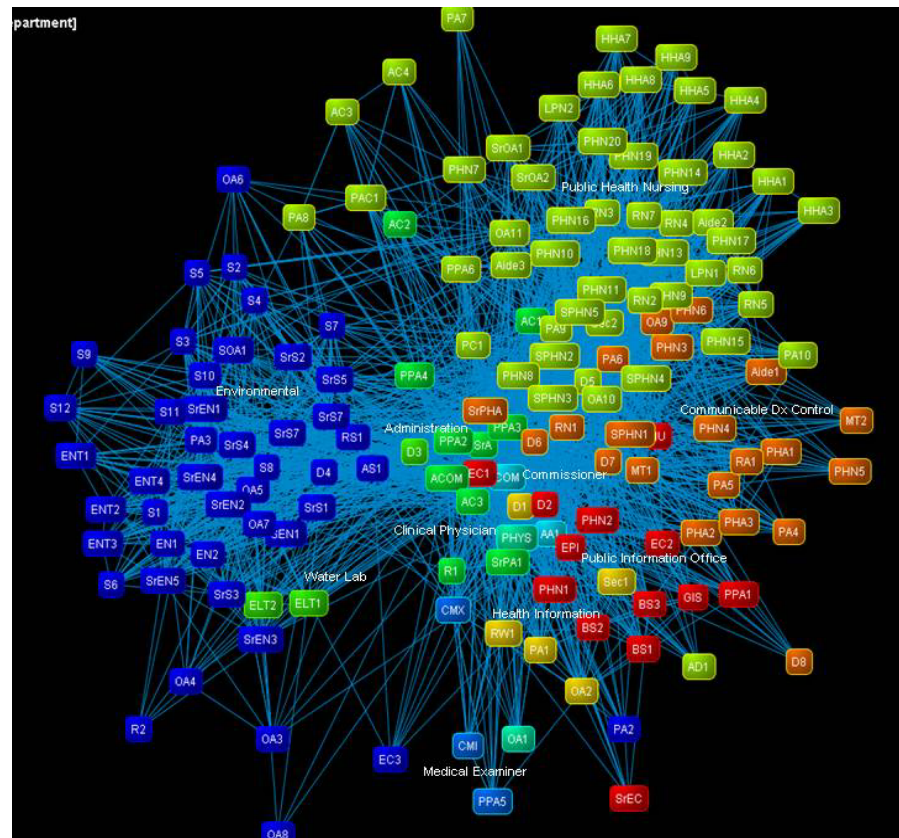
Carnegie Mellon University: *ORA*

Overcomes limitation of classic social networks that ignore what people do

Relational datasets organized into adjacency matrices analyzed as a Metamatrix

	People	Knowledge	Resources	Tasks
People	<b>Social network</b> Who talks to who	<b>Knowledge Network</b> Who knows what	<b>Resources Network</b> Who has access	<b>Assignment Network</b> Who does what
Knowledge		<b>Information Network</b> Connection among types of knowledge	<b>Resources Usage Requirements</b> Knowledge to use resources	<b>Knowledge Requirements</b> Knowledge needed for tasks
Resources			<b>Interoperability Requirements</b> Connections among resources	<b>Resource Requirements</b> Resources needed for tasks
Tasks				<b>Precedence Dependencies</b> Tasks related to tasks

# Feasibility Study conducted in 2005



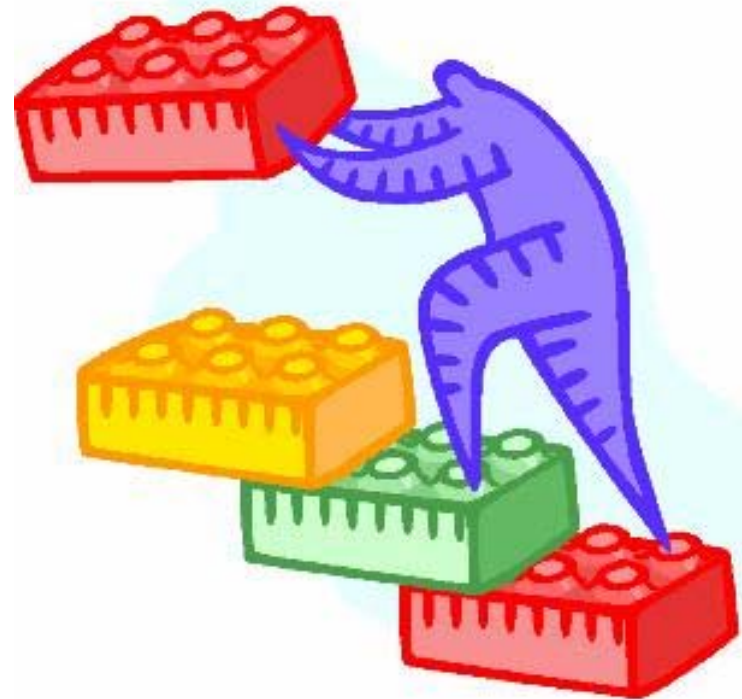
Findings showed utility of method for PH but

- Need accurate capture of **public health work**
- Develop a **standard** instrument for network data collection for baseline, interagency comparison

# Method to identify minimum data set describing PH work

## Multi-step qualitative method

- Term extraction
- Iterative review
- Expert opinion
- Practitioner review
- Survey development
- Field test of survey



# Sources of Practice Documentation

## Association of Public Health Laboratories

Requirements for Public Health Laboratory Information Management Systems Business Process Descriptions

## Association of Schools of Public Health

MPH Core Competencies

## Council on Linkages between Academia and Public Health Practice

Core Competencies for Public Health Professionals

## NACCHO

2005 Profile of Local Health Departments

Operational Definition of a Functional Local Public Health Agency

## Public Health Informatics Institute

Taking Care of Business: A collaboration to define local public health business practices (*Elements of nine business processes, using standard business process analysis tools, such as context and task flow diagramming*)<sub>7</sub>

## Sources (cont)



National Public Health Performance Standards Program  
Local Public Health System Performance Assessment Instrument

North Carolina Local Health Department Accreditation Program  
2007 Health Department Self-Assessment Instrument

Public Health Workforce Recruitment, Retention and Promotion in the Civil  
Service System (research study)  
Public health position descriptions

Healthy People 2010  
Chapter 23 Public Health Infrastructure Objectives

Public Health Functions Committee  
Essential Services of Public Health



# Term Extraction

- Over 500 task knowledge resource terms extracted through iterative review
- Crosswalk w/ Essential Services and most **common activities** (top 10 from NACCHO survey plus management and finance)
- De-duplicated and consolidated similar terms
- Result: **58T, 75K, 68R**

# Expert Opinion



- Conference call
- Each term reviewed for suitability
- Terms added and removed
- Terms grouped (ie admin tasks, service tasks)
- Result: **45T, 56K, 59R**

# Practitioner Review, Field Test

- Focus Group w/ 12 practitioners LHD
- Formatted as mock survey
- Field test instrument in 2 LHDs

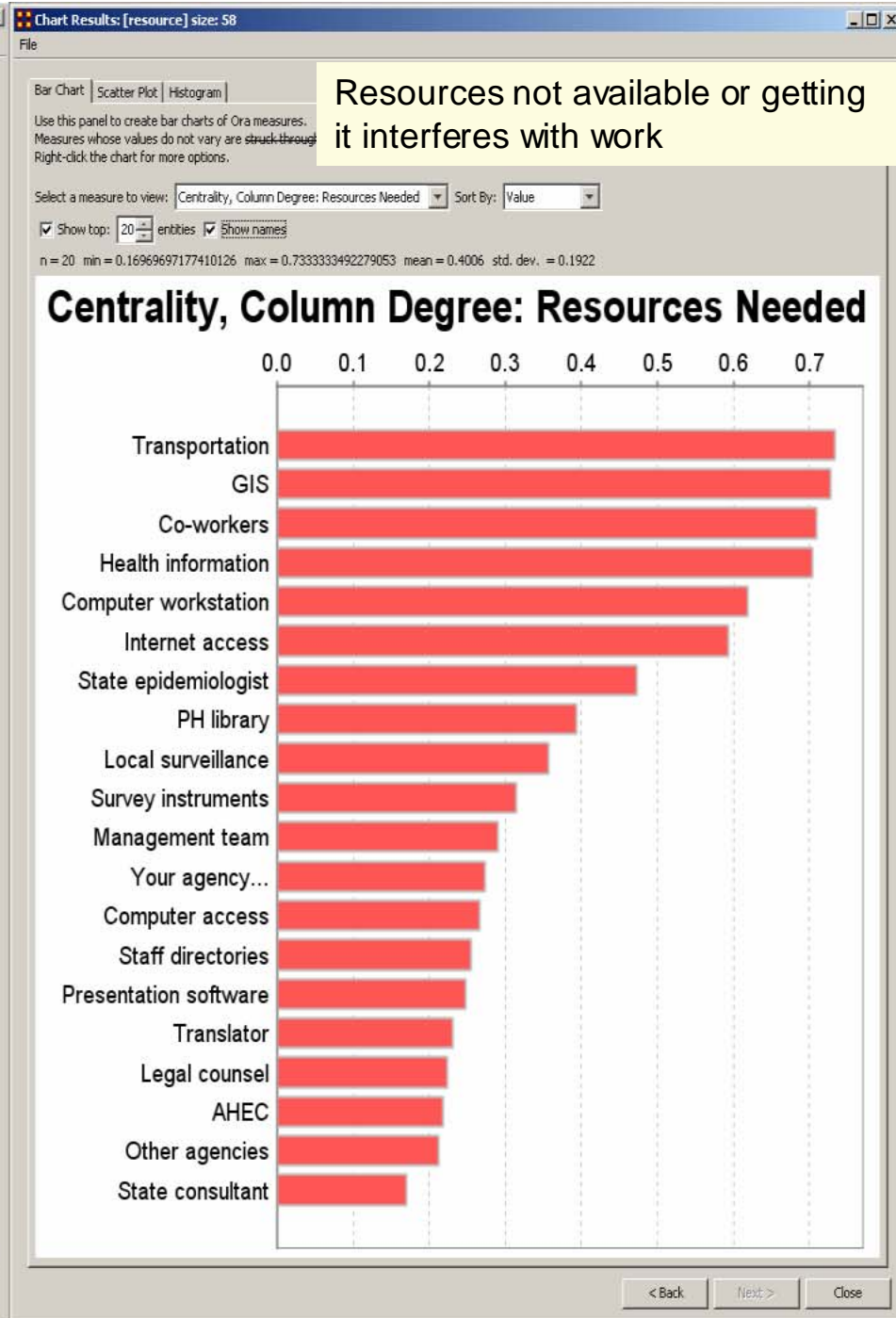
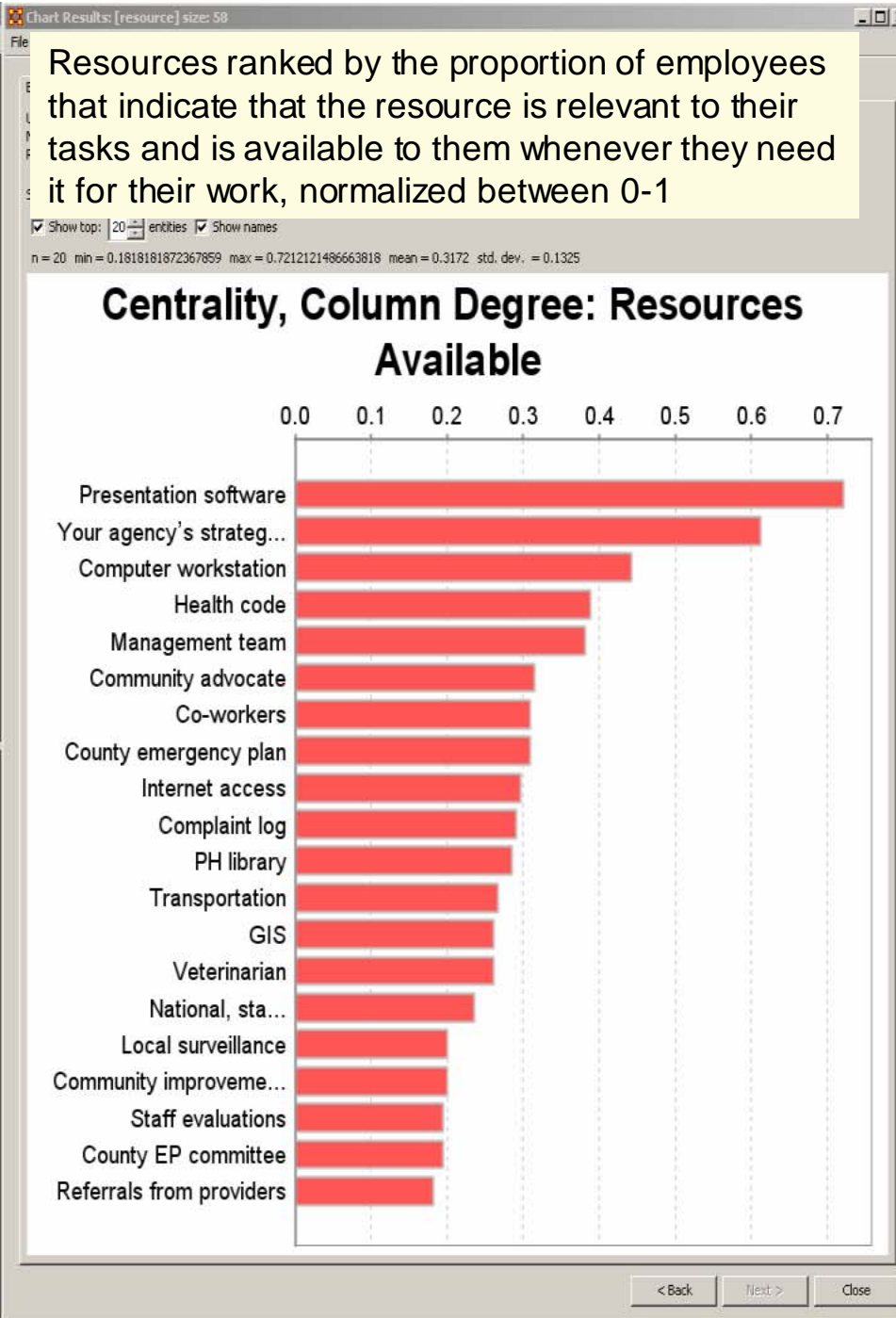
Result minimum data set to describe PH work

- **53 knowledge**
- **39 resources**
- **44 tasks**

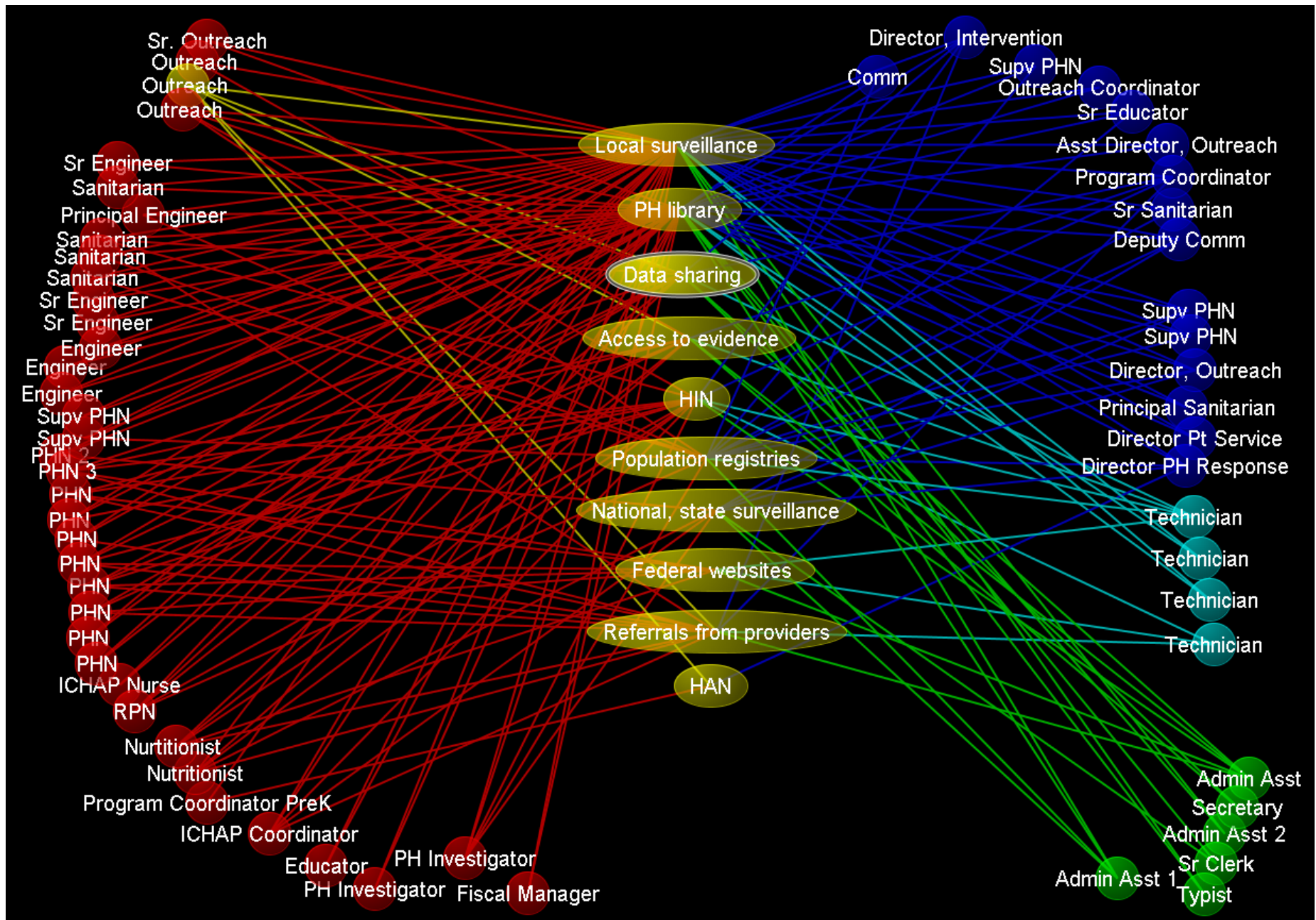
# Progress: Survey Instruments

## Minimum data set

<b>PART 4 RESOURCES</b>		
<b>PART 3 KNOWLEDGE</b>		
<p><b>PART 2 TASKS</b></p> <p>Please <b>darken</b> bubble (W) next to each task that you perform as <i>part of your normal work</i>.</p> <p>Please <b>darken</b> bubble (F) next to each task that is not part of your normal work but you have the experience and knowledge required to <i>fill in</i> if necessary.</p> <p>Please <b>leave blank</b> bubbles next to tasks that are not part of your work nor tasks where you could fill.</p> <p style="text-align: center;">(W) = part of your normal <b>Work</b>      (F) = you have the experience and knowledge required to <b>Fill in</b></p>		<p>LHD #01 Individual ID #____</p> <p>...dge (that is, knowledge</p> <p>...available</p> <p>...o your tasks</p> <p>...cal public health laws, ances</p> <p>...the agency</p> <p>...communication plan</p> <p>...motivate people toward a</p> <p>...ganizational learning</p> <p>...ments</p> <p>...les and vision</p> <p>...ocol</p> <p>...es (i.e. OSHA regulations)</p> <p>...l accounting principles</p> <p>...t requirements</p> <p>...rograms</p>
<p><b>Administrative Tasks</b></p> <p>(W) (F) Recruit staff</p> <p>(W) (F) Schedule staff</p> <p>(W) (F) Train Staff</p> <p>(W) (F) Supervise, plan or distribute work to others</p> <p>(W) (F) Evaluate staff performance</p> <p>(W) (F) Develop and/or manage contracts and service agreements</p> <p>(W) (F) Prepare applications for external funding</p> <p>(W) (F) Post information for use by staff</p> <p>(W) (F) Use the internet and other electronic systems to access information</p> <p>(W) (F) Develop budgets</p> <p>(W) (F) Manage inventory</p> <p>(W) (F) Process requests from the public (for services, information or appointments)</p>	<p><b>Service Tasks</b></p> <p>(W) (F) Conduct community assessments</p> <p>(W) (F) Report data to state system</p> <p>(W) (F) Register and enroll clients</p> <p>(W) (F) Deliver/ document clinical services</p> <p>(W) (F) Evaluate program performance</p> <p>(W) (F) Provide education and counseling (to individuals, groups, families, facility operators, and/or providers)</p> <p>(W) (F) Review medical records</p> <p>(W) (F) Develop informational and training materials</p> <p>(W) (F) Develop protocols and instruments for surveillance</p> <p>(W) (F) Obtain information, including specimens and samples</p> <p>(W) (F) Represent the department on local and statewide committees</p>	<p>...use it is <i>completely</i> relevant to your tasks.</p> <p>...alth assessment</p> <p>...alth improvement plan</p> <p>...y groups and</p> <p>...es</p> <p>...schedules</p> <p>...assessment</p> <p>...n and training log</p> <p>...luations</p> <p>...uestionnaires, forms</p> <p>...c business plan</p> <p>...ncy plan</p>



Employees colored by staff level and resources they report are not readily available when they need it to do their work—note how many indicate a need for greater access to local surveillance data





Right-click the chart for more options.

Select a measure to view: Centrality, Column Degree: Task Assigned Sort By: Value

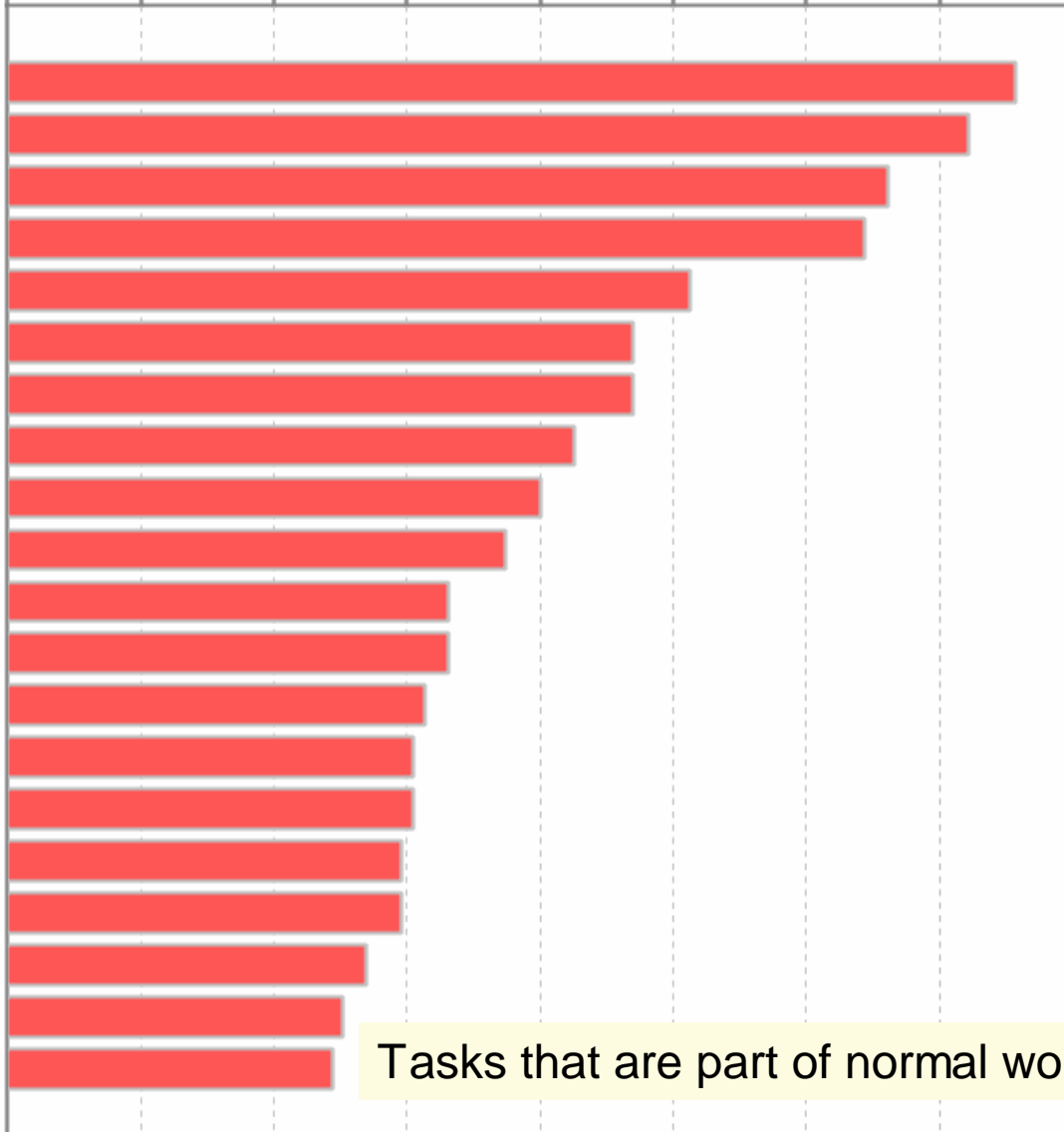
Show top: 20 entities  Show names

n = 20 min = 0.24347825348377228 max = 0.7565217614173889 mean = 0.4186 std. dev. = 0.1536

## Centrality, Column Degree: Task Assigned

0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7

- Use email
- Use internet
- Phone
- Manage files
- Meet w/ clients
- Process requests
- Educate public
- Deliver health services
- Review records
- Serve on committees
- Post information
- Register and enroll
- Develop partnerships
- Manage inventory
- Discuss fees
- Conduct site visits
- Report data
- Obtain specs
- Supervision
- Manage personnel



Stats allow future analysis across LHDs

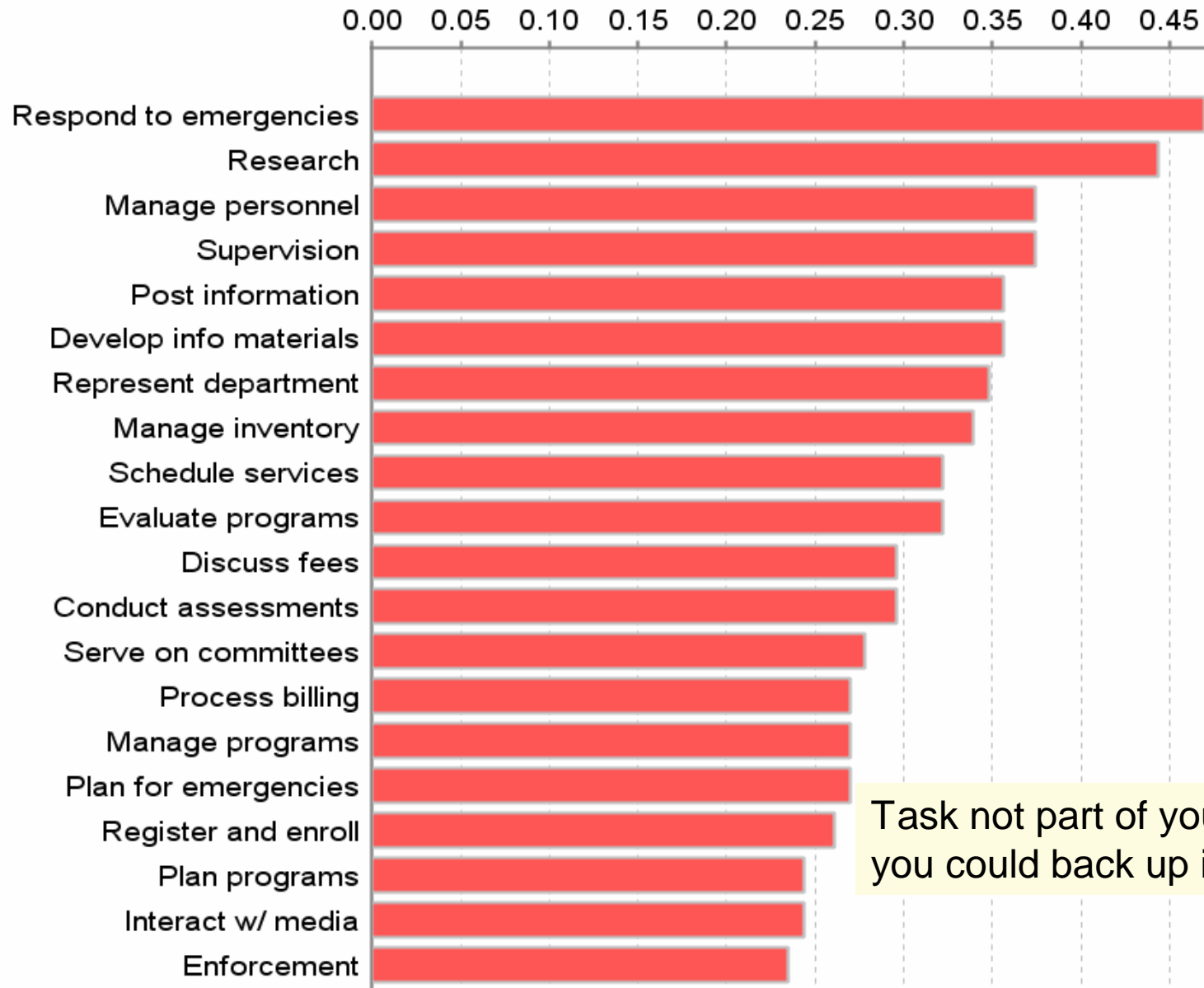
Tasks that are part of normal work

Select a measure to view: Centrality, Column Degree: Task Backup Sort By: Value

Show top: 20 entities  Show names

n = 20 min = 0.2347826063632965 max = 0.469565212726593 mean = 0.3182 std. dev. = 0.0618

## Centrality, Column Degree: Task Backup



Task not part of your normal work but you could back up if needed

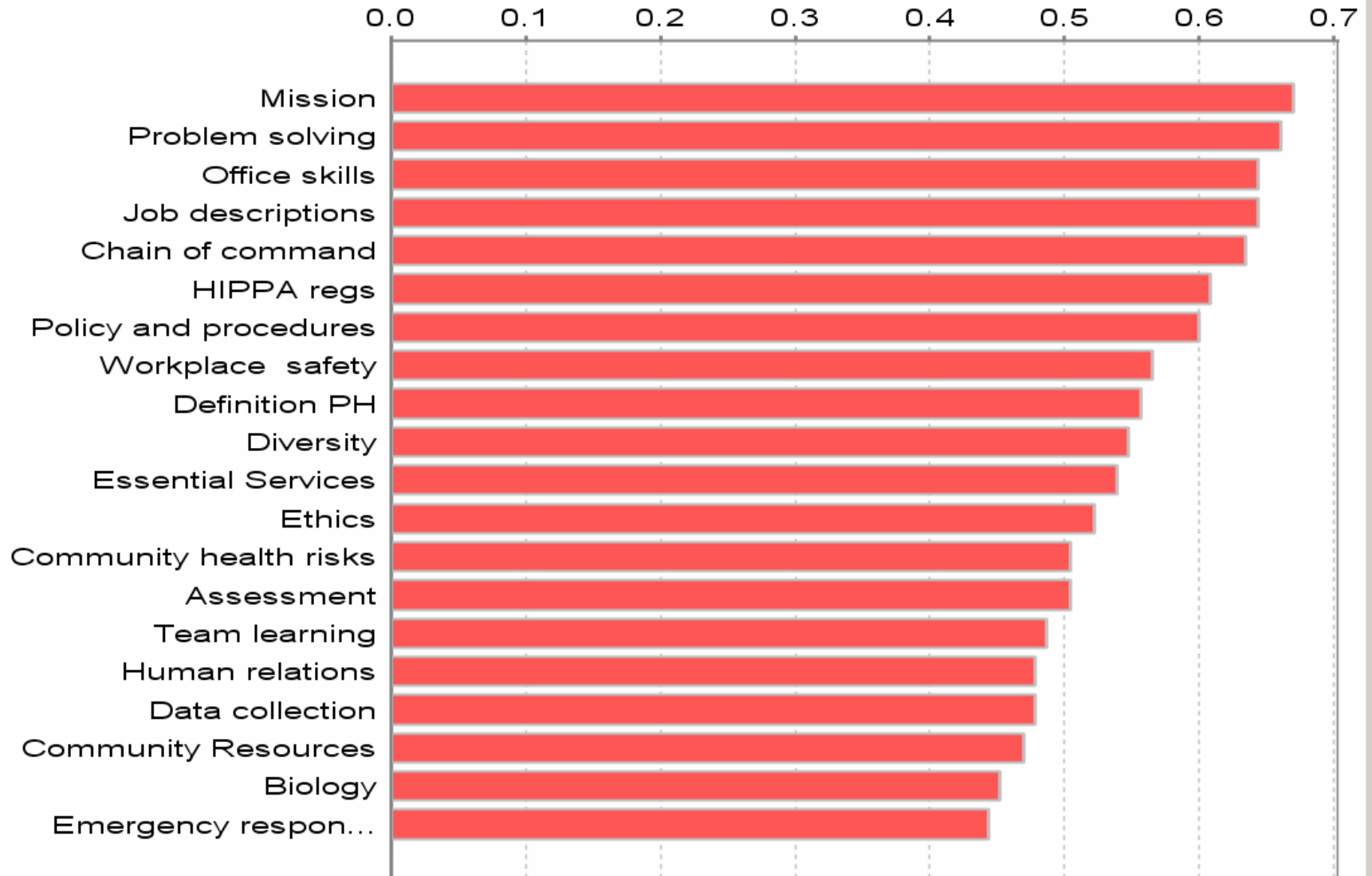


## Knowledge for your work

Indicate the items for which you have **better than average** knowledge (for example, where you think “I could tell people a lot about this”).

n = 20 min = 0.4434782564640045 max = 0.6695652008056641 mean = 0.5504 std. dev. = 0.0704

### Centrality, Column Degree: Knowledge



# Outcome

- Minimum data set
- Based on established practice documentation
- For use across health departments that vary in composition yet conduct *common activities*
- Future use in national sample for comparative study

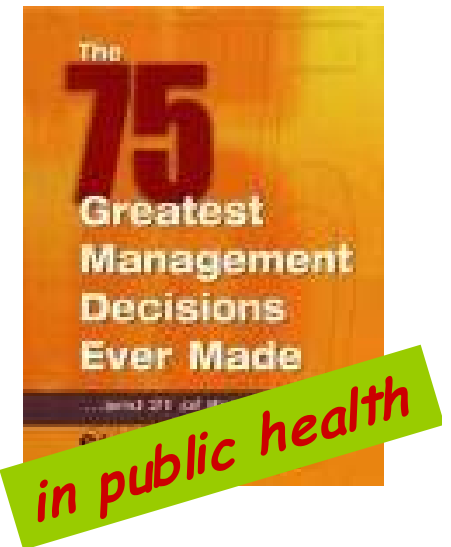
# Implications

## Produces standard results

- support local management **decisions**
- build **baselines** for network measurement
- allow **comparisons** between LHDs that can inform system-wide infrastructure development

## *Other uses?*

- document work processes
- determine task-resource dependencies
- building uniform job descriptions
- developing training frameworks



# Next steps



National sample 8 LHDs

Correlation study with National  
Public Health Performance data

# Thank you

