



# Determining Institutional Progress towards a Culture of Quality Improvement at a State Health Department

## **BACKGROUND**

In 2012, the Rhode Island Department of Health (RIDOH) introduced a quality improvement (QI) initiative to its work place and since then has applied for national accreditation through the Public Health Accreditation Board (PHAB). For accreditation, public health agencies are required to develop and cultivate a QI culture, and RIDOH started training its workforce in QI the same year. QI trainees identify a program performance issue and complete an outcomes-based QI project eight-ten months after training completion.

RIDOH used the 6-Phases Roadmap to a Culture of QI from the National Association of City and County Health Officials (NACCHO) to assess its progress towards the goal of fully integrated performance management systems (Phase 6). After conducting a reasonable search for similar instruments, no survey tool to assess staff and organizational characteristics described in NACCHO's QI framework was found.

## **GOALS**

- a) Determine where is RIDOH on NACCHO's Roadmap to a total institutional QI culture, and,
- b) Use findings to identify strategies and prioritize staff groups to engage in QI efforts to transition them into higher Phases of NACCHO's framework.

## **METHODS**

A 16-item questionnaire was developed based on NACCHO's institutional framework. The tool contains 8 QI domains reflecting individual (QI awareness, relevance to own job, knowledge/skills, three measures of QI practice) and institutional (organizational relevance of QI and team practice) characteristics. The tool also contains 11 organizational variables (1. time at RIDOH, 2. being a supervisor, 3. being part of organization leadership, 4. job function: clerical, field services, measurement, administrative, leadership; 5. QI ad-hoc participation, and 6. QI training source: internal or external). Questions were piloted from mid-December 2014 to mid-January 2015 with participation of RIDOH staff from several programmatic areas and training backgrounds. Questionnaire administration was estimated at 5 minutes.



## SAMPLE

The sampling frame (N=463) included all active RIDOH employees. Temporary workers, interns and consultants were excluded. Staff housed at RIDOH reporting to other state agencies or organizations were also excluded. The survey was conducted during the first three weeks of February 2015 with one reminder sent at the end of week 2. Questionnaire completion and return was conducted electronically via Survey Monkey.

## FINDINGS

### Survey Participation

All RIDOH organizational units participated and response rate was 45%. Participation for most job titles (listed on Table 1 below) was representative, ranging from 14.3% (group 2) to 100% (group 11). Responses from staff in related functions were aggregated to increase analysis power. Groups 2, 3, 4 and 5 were merged into a “Field Services” category; groups 7, 8 and 9 into “Measurement<sup>1</sup>”; and groups 10 and 11 into “Leadership.” This increased some of the response rates in the smaller groups (to 23.9; 47.8, and 77.8%, respectively) and made possible determinations of QI Phase by job function.

**Table 1: RIDOH survey response, by job function**

POSITION	RESPONDED	STAFF	RESPONSE RATE (%)
1. exec. assistant/laboratory assistant/licensing/information/implementation aid/data control clerk/word processing typist	29	51	56.9
2. clinical social worker/program liaison worker/physical therapist/public health nutritionist	3	21	14.3
3. clinical/environmental/environmental laboratory/forensic scientist/radiological health/field/lab technician/breath analysis	16	61	26.2
4. sanitarian/sanitary engineer/food inspector/industrial hygienist/scene investigator/public health nurse/nurse evaluator/beauty shop inspector/health facility surveyor/medical examiner agent	16	67	23.9
5. health policy and systems/public health promotion/disease intervention/environmental health/program planning/environmental food specialist	21	85	24.7
6. administrative officer/program manager/office manager/program coordinator/resource specialist/production system/medical care specialist/program planner/health assistant administrator/teller	46	65	70.8
7. policy analyst/program/records/systems analyst	6	17	35.3
8. epidemiologist/evaluator/research technician/gis/quality assurance officer/data administrator/data manager/programmer	21	35	60.0
7. policy analyst/program/records/systems analyst	6	17	35.3
10. medical examiner/assistant medical examiner/laboratory center/forensic science supervisor/medico legal administrator	6	10	60.0
11. health director/deputy director/assistant director/chief financial officer/chief of staff/public information officer	8	8	100
12. responses missing	8	--	--
<b>TOTAL</b>	<b>208</b>	<b>463</b>	<b>44.9</b>

Respondents’ time at RIDOH ranged from 0.3 to 37.4 years (median=5.7; mean=10.4; 95% CI [9.0-11.7]). Other survey findings related to participation include:

- Staff-to-supervisor ratio was 1.9

<sup>1</sup> This includes Evaluators, epidemiologists, research technicians and other staff managing data



- Supervisors reported an average of 4.8 employees and 3.0 FTEs

### Status of RIDOH’s QI initiative

This part of the analysis addressed the current status of RIDOH’s QI initiative and whether or not employees are at a similar Phase for each of the eight domains. Table 2 summarizes responses by QI domain and NACCHO Phase and indicates that:

- Institutionally, RIDOH is in Phase 3-4 for most QI domains
- In each QI domain, staff is distributed across all NACCHO Phases

Table 2: RIDOH survey response by QI domain and NACCHO Phase

QI DOMAIN	PHASE 1 N (%)	PHASE 2 N (%)	PHASE 3 N (%)	PHASE 4 N (%)	PHASE 5 N (%)	PHASE 6 N (%)	TOTAL
aware	not familiar 32 (10.7 <sup>2</sup> )	little familiarity 34 (18.2)	somewhat familiar 71 (38.0)	very familiar 62 (33.2)	not assessed n/a	not assessed n/a	187
relevant to own work	activity of no or little personal value	temporary activity requiring limited involvement 33 (18.9 <sup>2</sup> )	added job responsibilities/ assess job performance	learn new skills/apply new skills in own work 64 (36.6)	increase overall employee effectiveness 28 (16.0)	long-term plan for using QI in everyday work 50 (28.6)	175
relevant to mission of organization	function not essential to public health	temporary project 15 (8.4 <sup>2</sup> )	training exercise/justify budget allocation 12 (6.7 <sup>2</sup> )	learn new skills/apply new skills with other staff 28 (15.7)	increase effectiveness of institutional operations 56 (31.5)	long-term plan for using QI in everyday work 67 (37.6)	178
knowledgeable	none 36 (19.4 <sup>2</sup> )	little	some 81 (43.6)	knowledgeable 54 (29.0)	knowledgeable with experience as trainer 15 (8.1)	expert (not assessed) n/a	186
individual practice (level)	not involved 25 (15.1)	involved very little 23 (14.0)	somewhat involved 35 (21.2)	involved 51 (30.9)	very involved 31 (18.8 <sup>2</sup> )	completely involved	165
individual practice (# of projects)	none 47 (29.9)	1 project 36 (22.9)	2 projects 31 (19.7)	3-4 projects	5-6 projects 43 (27.4 <sup>2</sup> )	7+ projects	157
individual practice (% of work time)	none 46 (28.2)	1% 21 (12.9 <sup>2,3</sup> )	2-3%	4-10% 43 (26.4)	11-20% 21 (12.9)	21%+ 32 (19.6)	163
team practice (level)	not involved	involved very little 11 (22.9 <sup>2,3</sup> )	somewhat involved	involved 22 (45.8)	very involved 15 (31.2 <sup>2,3</sup> )	totally involved	48

<sup>1</sup> Adapted from NACCHO, Roadmap to a Culture of Quality Improvement <http://qiroadmap.org/culture-to-qi/>

<sup>2</sup> Contiguous cells were collapsed if one or more had low statistical reliability (RSE >30%)

<sup>3</sup> RSE is between 20 and 30%; estimate should be interpreted with caution

A breakdown of findings is provided below.

- Familiarity with RIDOH’s QI Initiative was similarly distributed across Phases 1-2 (28.9%), Phase 3 (38.0%) and Phase 4 (33.2%).
- More than three-fourths of respondents characterized RIDOH’s initiative either as a way to learn/apply new skills to own job (36.5% in Phase 4), increase overall employee effectiveness (16.0% in Phase 5), or as part of a long-term plan to use QI in everyday work (28.6% in Phase 6). One in five respondents are in Phases 1-3 for this domain.



- When asked about QI’s organizational relevance, four out of five participants characterized the initiative as a way to learn/apply new skills with other staff (15.7% in Phase 4), increase team work (31.5% in Phase 5), or identified QI as part of a long-term plan to apply QI measures to everyday work (37.6% in Phase 6). Approximately, 15% staff is currently in Phases 1-3.
- Knowledge about QI tools and methods is predominantly in Phase 3 (43.5% of response); 19.4% is in Phases 1-2 and 37.1% in Phase 4 or higher.
- Involvement in activities based in QI tools and methods ranged from none (15.1% in Phase 1) to full involvement (18.8% in Phases 5-6). Approximately one-third (30.9%) of the staff is in Phase 3 of QI practice; 27.4% has participated in 3 or more QI projects (Phase 4 and above) since institutional QI training began (2012) and 32.5% currently spends 4% or more of work time in QI practice (Phase 5 or above).
- Response to the QI team practice domain was lower (N=48) as this question was administered only to supervisors. One in five respondents are in Phases 1-3 for QI team practice (not involved, little involved or somewhat involved).

QI Domains and NACCHO Phases

Responses were used to identify the proportion of staff “at or above” and “below” NACCHO Phase. Respondents included in the “At or above” Phase column in Table 3 represent at least 50% of the staff in that domain. The “Below” Phase column indicates the proportion of staff that can be targeted to advance their QI awareness, knowledge or practice to reach a higher Phase of NACCHO’s framework. The column on the right provides a sense of the number of staff most likely to benefit from interventions for improving QI domain performance<sup>2</sup>.

**Table 3: RIDOH survey response and NACCHO Phase, by QI domain**

QI Domain	NACCHO Phase	At or Above Phase (%)	Below Phase (%)	Staff Below Phase (N)
1. Awareness	3	71.3	28.7	133
2. Relevance to own work	4	60.3	39.7	184
3. Relevance to organizational mission	5	69.1	30.9	143
4. Knowledge	3	83.7	16.3	75
5. Individual practice (level)	4	70.9	29.1	135
6. Individual practice (number of projects)	3	70.0	30.0	139
7. Individual practice (% of work time)	4	58.8	41.2	191
8. Team practice (level)	4	77.0	33.0	153

<sup>2</sup> A logistical regression analysis is being completed to further characterize and prioritize staff needs



Organizational Factors influencing NACCHO Phases

Findings were also analyzed using an institutional perspective for the 9 organizational factors with statistically significant associations (see Table 4 below). Staff differences in NACCHO phase for these organizational factors are expressed as relative risks<sup>3</sup> (RR).

Table 4: Organizational factors associated with staff being in a lower NACCHO Phase, by Institutional Perspective

Institutional Perspective	RIDOH'S Organizational Factor	QI Domain				
		Familiarity	Skills	Practice		
				Level	# Projects	% Work Time
RR*	RR	RR	RR	RR		
Agency's affiliation	Time at RIDOH below median (5.7 years)	1.5	1.3	ns	1.4	ns
Supervisory role	Does not supervise staff	ns	1.5	1.7	1.4	1.6
Agency's Leadership	Not part of agency leadership	ns	1.5	2.3	1.6	ns
Job functions	Clerical staff	1.5	ns	ns	1.5	ns
	Field staff	2.6	ns	ns	ns	ns
	Measurement staff	ns	1.3	ns	ns	ns
QI planning	Not part of QI ad-hoc groups	ns	1.8	1.8	1.6	2.3
QI training	Webinar/own reading only source of QI skills	1.6	ns	ns	1.4	1.9
	All sources excluding outside sources	ns	1.6	ns	ns	ns

\* The size of a relative risk (RR) reflects how many times being associated with a given organizational factor increases the risk for employees being in a lower NACCHO Phase compared with staff not associated with that factor. A RR equal to 1 mean no effect or not being at increased risk of the outcome.

Findings are summarized next based on statistically significant differences in NACCHO Phase for all QI domains associated with organizational factors.

<sup>3</sup> Note that NACCHO Phases associated with each organizational factor, levels being compared, and their corresponding *p-value* (Chi-Square test) can be found beginning page 9 in Tables 5 a-e.



- The largest number of factors associated with a lower NACCHO Phase were related to organizational role (not being a supervisor) and planning functions (no QI committee participation) and involved similar QI domains (skills and the three practice measures).
- Three organizational factors were associated with a lower NACCHO Phase and included agency affiliation (less than the reported median of 5.7 years); function (not part of leadership); and training (no prior QI training).
  - Less time at organization and no prior QI training were associated with lower awareness about RIDOH's QI initiative.
  - Staff with less time at organization and not part of leadership had lower QI skills.
  - These three organizational factors were associated with a lower NACCHO Phase in the QI practice domain, and had similar relative risks compared to other staff.
- Other institutional dimensions had fewer organizational factors associated with a lower QI Phase.
  - Two factors were associated with a lower QI Phases. Staff with clerical functions was less familiar with RIDOH's QI initiative and less involved in QI practice (number of projects) compared to all other employees.
  - Lower QI Phases associated with only one factor occurred in two institutional domains (function and training). Field services staff was less familiar with the QI initiative and measurement staff and staff not trained by outside sources had lower QI skills.

Findings in the next paragraphs summarize statistically significant differences in NACCHO Phases for all organizational factors associated with QI domains.

#### Awareness

This QI domain was associated with a lower NACCHO Phase for four of the nine organizational factors. Employees in field services functions were at the highest risk (RR=2.6) for being at a lower Phase, followed by staff with no previous QI training (RR=1.6), and staff in clerical functions and less time at organization (both RRs=1.5).

#### QI Knowledge/Skills

Being at a lower level for this domain was associated with six organizational factors.

Compared to staff participating in QI-related committees, non-participating employees were less skilled in QI tools and methods (RR=1.8), followed by staff trained in QI from other than



outside sources (RR=1.6), non-supervising and non-leadership staff (RR=1.5), and staff with less time at organization and measurement functions (both RRs=1.3).

### Relevance to work

There were no statistically significant staff differences in NACCHO Phase for organizational factors in three (relevance of RIDOH's initiative to own job, relevance to organization mission, and team practice) of the eight QI domains (not shown in Table 4). Differences in NACCHO Phase for QI team practice cannot be ruled out due to small sample size.

### Practice

Staff in this domain is associated with a low NACCHO Phase in six out of the nine organizational factors.

Of the three measures used as descriptors of QI practice, number of projects was associated with a lower NACCHO Phase for most (six) of the nine organizational factors. Involvement in a low number of QI projects occurred twice more often among staff in a lower Phase than in staff with low QI activity level and low percent of work time in similar NACCHO Phases.

- The other two indicators of QI practice (level and percent of work time) were associated with a lower NACCHO Phase for three of the organizational factors.
- All three measures of QI practice were consistently associated with a lower NACCHO Phase in non-supervising staff and staff not part of ad-hoc committees.
- Compared to leadership staff, non-leadership employees were at a lower NACCHO Phase for two out of the three practice measures (level and number of projects).
- Clerical staff, staff working less time at organization, and staff not QI-trained were at a lower NACCHO Phase in one of the practice measures (number of QI projects).

## **CONCLUSIONS**

The RIDOH QI initiative is in NACCHO Phase 5 for one of the eight QI domains (relevance to organizational mission); in Phase 4 for four of the domains (relevance to own job, level and percent of work time spent in QI practice, and team practice level); and in Phase 3 for remaining domains (awareness, individual skills and number of individual QI projects).

Two domains (relevance of QI initiative to own work and organizational mission) are not associated with staff differences for any of RIDOH's organizational factors considered in the analysis. Of the three QI domains associated with Phase differences, two (skills and practice) are associated with a lower phase for six out of nine organizational factors; the awareness domain is associated with four. Skills and practice domains coincide in four of the six associations (time in organization below median, non-supervisory and non-leadership function, and no participation





in ad-hoc committees). The awareness domain coincides with the other two domains for staff being at different NACCHO Phases only for affiliation below median employment time. The QI practice domain related to number of projects occurred in all instances when there was at least one statistically significant difference between NACCHO Phases and levels of the organizational factor being considered. This was the only measure associated with a low Phase for institutional affiliation; one of two practice measures with a similar outcome association for non-leadership staff and webinar/own reading being the only source of QI skills; and the only one of three QI practice measures associated with a low NACCHO Phase for non-supervisors and non-ad-hoc group participation.

These findings suggest that the QI practice measure that uses number of projects is more sensitive for detecting differences compared to the two other measures for all QI domains where there was a difference in NACCHO Phase.

## **RECOMMENDATIONS**

Findings indicate that organizational factors causing differences in NACCHO framework are multiple; most of these factors cluster around more than one domain, and several contribute concurrently to the observed staff differences. Awareness about RIDOH's QI initiative is lower in the clerical and field service functions as well as among staff with less time at the organization. Specific activities targeting these employees could increase familiarity with the initiative and boost interest for participation in ongoing and future QI activities.

Non-supervisory and non-leadership employees as well as staff involved in data, measurement and evaluation could benefit from QI training. Likewise, QI alumni and other staff could be engaged in post-training projects to strategically foster cross-divisional and inter-disciplinary QI partnerships, and all QI activities should have appropriate allocations of staff's time and supported by leadership and supervisors.

A second strategic area suggested by findings is to consider involving more staff in QI ad-hoc committees. Lack of participation in these activities is associated with lower QI skills and level of individual involvement in the three measures of QI practice. As for new staff, several strategies can be used to make new employees aware of the QI initiative during the orientation process, and to make this information available to staff in the clerical and field services currently with reported lower awareness levels.

QI resources, including information for future in-house and outside QI training available, need to be widely disseminated to staff. Previous formal QI training should be determined during recruitment to facilitate appropriate use of in-house training resources and timely participation in ad-hoc committee activities and QI projects. Lastly, the QI Council needs to have a more direct and strategic role in the selection of QI projects, communicating QI goals and becoming the QI voice to inform and engage leadership in a true advocacy role for a culture of QI.





## APPENDIX

**Table 5a: RIDOH QI Phase by supervisory role**

QI Domain	Supervisor QI PHASE	$p^1$	Staff QI PHASE	Overall QI PHASE
1. Awareness	4	<.0001	3	3
2. Relevance to own work	4	ns	4	4
3. Relevance to organizational mission	5	ns	5	5
4. Knowledge	4	<b>0.0038</b>	3	3
5. Individual practice (level)	4	<b>0.0158</b>	3	4
6. Individual practice (number of projects)	3	<b>0.0003</b>	2	3
7. Individual practice (% of work time)	3	<b>0.0028</b>	2	3
8. Team practice (level)	4	n/a	n/a	n/a

<sup>1</sup> Row distributions for outcome variable levels are different

**Table 5b: RIDOH QI Phase by time in organization**

QI Domain	Lower 50 Percentile (<5 years) QI PHASE	$p^1$	Higher 50 Percentile (5 years +) QI PHASE	Overall QI PHASE
1. Awareness	3	<b>0.0094</b>	3	3
2. Relevance to own work	4	ns	4	4
3. Relevance to organizational mission	5	ns	5	5
4. Knowledge	3	<b>0.0048</b>	4	3
5. Individual practice (level)	3	ns	4	4
6. Individual practice (number of projects)	2	<b>0.0065</b>	3	2
7. Individual practice (% of work time)	4	ns	4	4
8. Team practice (level)	4	ns	4	4

<sup>1</sup> Row distributions for outcome variable levels are different



Table 5c: RIDOH QI Phase by QI ad-hoc participation

QI Domain	No QI PHASE	$p^1$	Yes QI PHASE	Overall QI PHASE
1. Awareness	3	<.0001	4	3
2. Relevance to own work	4	0.0180	4	4
3. Relevance to organizational mission	5	ns	6	5
4. Knowledge	3	<.0001	4	3
5. Individual practice (level)	3	0.0002	4	3
6. Individual practice (number of projects)	2	<.0001	4	2
7. Individual practice (% of work time)	4	0.0007	4	4
8. Team practice (level)	4	ns	4	4

<sup>1</sup> Row distributions for outcome variable levels are different

Table 5d: RIDOH QI Phase by Job Function (Clerical, Field Services, Administrative, Measurement and Leadership)

QI Domain	Clerical QI PHASE	$p^1$	Field Services QI PHASE	$p^1$	Admin. QI PHASE	$p^1$	Measurement QI PHASE	$p^1$	Leadership QI PHASE	$p^1$	Overall QI PHASE
1. Awareness	3	<.0001	2	0.0003	3	ns	3	0.0135	4	ns	3
2. Relevance to own work	4	ns	5	ns	4	ns	4	ns	4	ns	4
3. Relevance to organizational mission	4	ns	5	ns	5	ns	5	ns	6	0.0484	5
4. Knowledge	3	0.0400	3	0.0207	4	ns	3	ns	4	0.0219	3
5. Individual practice (level)	2	ns	3	ns	3	ns	4	ns	4	0.0003	3
6. Individual practice (# of projects)	1	0.0050	2	ns	3	ns	2	0.0205	4	0.0013	2
7. Individual practice (% of work time)	1	ns	3	ns	4	ns	4	ns	5	0.0238	3
8. Team practice (level)	n/a	n/a	4	ns	4	ns	4	ns	4	ns	4

<sup>1</sup> Row distributions of levels of the outcome variable are different

<sup>2</sup> Row distributions for outcome variable levels are different when each QI source is compared to all other QI sources



Table 5e: RIDOH QI Phase by source of QI training

QI Domain	Webinar/ Reading QI PHASE	<i>p</i> <sup>2</sup>	Outside Training QI PHASE	<i>p</i> <sup>2</sup>	In-House Training QI PHASE	<i>p</i> <sup>2</sup>	Overall QI PHASE	<i>p</i> <sup>1</sup>
1. Awareness	2	<b>0.0005</b>	3	Ns	3	<b>0.0007</b>	3	<b>0.001</b>
2. Relevance to own work	4	ns	3	ns	5	ns	4	ns
3. Relevance to organizational mission	5	ns	5	ns	5	ns	5	ns
4. Knowledge	3	<b>&lt;.0001</b>	4	ns	3	ns	3	<b>0.0002</b>
5. Individual practice (level)	2	ns	4	ns	3	ns	3	ns
6. Individual practice (number of projects)	1	<b>0.0499</b>	3	ns	3	<b>0.0023</b>	2	<b>0.0003</b>
7. Individual practice (% of work time)	1	ns	4	ns	4	<b>0.0079</b>	4	<b>0.0369</b>
8. Team practice (level)	5	ns	4	ns	4	ns	4	<b>0.0296</b>
1 Row distributions of levels of the outcome variable are different								
2 Row distributions for outcome variable levels are different when each QI source is compared to all other QI sources								



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