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Sharing European Educational Experience in Public Health for Israel (SEEEPHI): harmonization, employability, leadership, and Outreach

Work Package 2 Report
Field Qualification Analysis in the Israeli Public Health System

AAC & ASPHER

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Background

Israel's health system is public and designed to care for almost 10 million citizens in a general low-cost manner [Rosen et al., 2015]. According to the National Health Insurance (NHI) Law which was introduced in 1995, all Israeli citizens are medically insured. The organization of the system is generally outlined in figure 1:

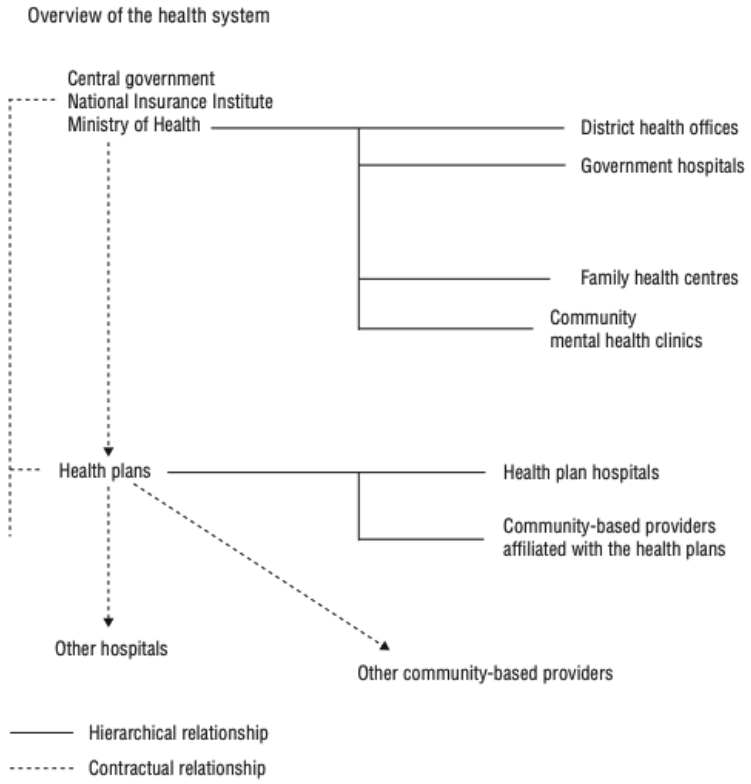


Figure 1: Overview of the Israeli healthcare system

(Adapted from https://www.euro.who.int/__data/assets/pdf_file/0009/302967/Israel-HiT.pdf?ua=1)

The nature and accomplishments of the health care system in Israel stems, to a large extent, from its historical foundation by organized social agreements and a consensus that society as a whole is responsible for the health care of its citizens. This guiding principle has been reflected in the structure of health services in Israel, combining mandatory state insurance with additional supplementary non-profit health care plans. Every citizen or permanent resident of Israel is free to choose from four competing, nationwide Health Maintenance Organizations (HMOs) which were established in the first half of the 20s century. These HMOs must provide their members with access to a statutory benefits package, which is termed as “health basket”. The Ministry of Health

owns and operates about half of the nation's acute care hospital beds, although they increasingly operate autonomously. The Ministry of Health also regulates the entire health care system in Israel. The largest HMO operates another third of the hospital beds, and the remainder of beds are operated through a mix of non-profit and for-profit organizations [Rosen et al., 2015].

The Ministry of Health has a regulatory position in the Israeli health system, it facilitates the Public Health (PH) Services, and is responsible for preventive medicine. The Ministry of Health provides national leadership in a broad range of PH domains, including food safety, control of communicable and non-communicable diseases, screening, health promotion, environmental health, and epidemiological monitoring. Its key partners include HMOs, municipalities, and the Ministries of Education, Sport and Culture, Finance, and Environment [Rosen et al., 2015].

The internal structure of the PH system includes the headquarter departments and the regional health department. The headquarter departments are usually responsible for policymaking and issuing guidelines, while the regional health departments are responsible for the provision of the services, fieldwork, and operating mother and child health clinics. Other units include the Public Health laboratories and the Israeli Center for Disease Control (ICDC). The departments are operated by physicians with PH expertise, public health nurses, environmental epidemiologists, and other public health-related professionals, such as dietitians, statisticians, and health promoters.

In 1994, the Ministry of Health established the ICDC. Its primary goal is to collect and analyze updated health-related data to provide health policymakers with the evidence base necessary to make informed decisions. The ICDC plays essential data collection, monitoring, and analysis roles regarding communicable and non-communicable diseases (including ongoing data surveillance at HMOs for early identification of outbreaks).

Israel has an extensive and active Healthy Cities Network [Donchin et al., 2006] in which the municipalities, residents, businesses, and NGOs work together to ensure the vitality and health of their cities. The Network was initiated in 1990, and by 2015 over 50 cities were participating. The Network has been vital for the more significant health promotion initiatives led by the Ministry of Health, including the National Programme to Promote Active and Healthy Lifestyle, the Ministry of Education, and the Ministry of Culture and Sport. Recently, the program has suffered significant cuts following cuts in the overall national budget.

Several Israeli universities run training programs in PH. Five of Israel's seven universities offer Master's in PH programs, and since 2015 an undergraduate PH program has been established

at the Ashkelon Academic College (ACC). The Israeli PH Physicians Association, being a part of the Israeli Medical Association, is responsible for developing the standards and syllabi for training PH physicians in collaboration with the Israeli PH services and the schools of PH.

In Israel, similarly to other places, the PH workforce (PHW) is struggling to define, classify and enumerate themselves due to the absence of professional licensure or certification. Furthermore, there is no consensus on a single purpose of a 'public health practitioner,' and central registries of PH professionals (apart from PH certified physicians and nurses) do not exist [Krasna et al., 2021, Gebbie et al., 2002]. The lack of professional categorization and recognition at the regulatory level detracts from the prestige associated with being a member of the PHW [Mansholt et al., 2020].

Apart from physical infrastructure, the single main component of PH services is the academic training and experience of its workforce. Insufficient training is a prime cause of low expertise which may, in turn, lead to an inadequate health care system. Efforts to evaluate the healthcare workforce often involve disparate assessments of physicians and nurses, yet fewer attempts have been taken at an integrated analysis of the needs reported by PH professionals within the health care system, as well as assessment of the skills and competencies in the PHW.

Objectives

This work package aims to assess PH field qualifications content and the competencies required by employer organizations in the Israeli PH health system, at three levels: entry, competent and expert. This assessment was performed by the WHO-ASPHER Competency Framework for the Public Health Workforce in the European Region [WHO-ASPHER, 2020].

Specific objectives:

1. Appraise the most important set of Essential Public Health Operations (EPHOs) for institutions that employ PH professionals.
2. Assess the preferred competencies of PH professionals, as perceived by high and mid-level managers among various employers in the Israeli health care system, based on the WHO-ASPHER Competency Framework for the Public Health Workforce.
3. Identify competencies strengths and weaknesses of PH professionals in different health organizations, three skill levels, and geographical regions of Israel.

4. Ascertain competencies strengths and weaknesses needed for the performance of the EPHOs in the Israeli health system.
5. Understand the preferred competencies of the PH workforce by in-depth interviews with key stakeholders in the healthcare system in Israel.
6. Develop recommendations for strengthening competency capacities in the Israeli PH system and advise PH schools in Israel with the required set of proficiencies needed by the Israeli health system.

Methodology

The work package included an online survey which was distributed among high and mid-level PH managers and through semi-structuredin-depth interviews with PH key stakeholders.

Population sample and procedure – online survey

The survey was distributed to a convenient sample of 130 high and mid-level PH managers in various healthcare organizations. The sample included a heterogenic gallery of practitioners who work in the PH core, and also in hospitals, non-profit organizations, and governmental agencies. The first referral was made by an electronic message on August 17th, 2021, describing the aim of the project and a link to the survey. Three additional reminders had been sent thereafter, including a personal phone call. The survey was ended in November 2021 and finally included 49 participants who responded to the study questionnaire, with a total of 37.6% response rate.

Population sample and procedure – semi-structured in-depth interviews

Semi-structured in-depth interviews were conducted with thirty-one managers from various PH employers. Of those, twenty-one women and ten men, who were interviewed between September and December 2021 after informed consent was obtained. The interviewees represented a wide geographical range of all health districts of Israel. The senior and intermediate managers in the PH field and health system represented the headquarters, field, and research levels. The interviews lasted between 40 minutes to an hour. All interviews were conducted over the telephone due to COVID-19 social distancing restrictions.

The study used purposeful sampling, common to qualitative research. In the purposeful sampling, the interviewees were selected to obtain optimal variety and serve as potential rich information sources to serve the study objectives. The informative richness and data saturation were achieved.

All interviews were conducted by a research assistant, a graduate clinical psychology student guided by the research staff. Study participants were assured that their details would remain confidential, and they could discontinue the interview at any point.

Research tools

The survey questionnaire was based on the WHO-ASPHER Competency Framework for the Public Health Workforce in the European Region [WHO-ASPHER, 2020], providing a framework to evaluate the competencies required by PH employers at three workforce levels - entry, competent and expert. To achieve the task goals while maintaining a high response rate and adjusting to the Israeli healthcare workforce management, the questionnaire was adapted to the local structure of the PH system and shortened the scale of the original answers.

The Israeli version of the survey included ten sections describing 44 PH competencies. The respondents were asked to rate if they have enough workers to fulfill the different competencies, in all three levels of expertise- entry, competent and expert. They could abstain in case the competency was not relevant in their departments.

The final version of the Israeli questionnaire also included ten demographic questions and a question in the participants were asked to point which of the ten Essential Public Health Operations (EPHOs) were most relevant to their organizations (Appendix A).

The ten sections outlining PH competencies included the following:

1. Science & Practice – 8 competencies.
2. Promoting health– 4 competencies.
3. Law, Policy & Ethics – 3 competencies.
4. One Health & Health Security – 8 competencies.
5. Leadership & Systems Thinking – 4 competencies.
6. Collaboration & Partnerships – 3 competencies.
7. Communication, Culture & Advocacy – 3 competencies.
8. Governance & Resource Management – 5 competencies.

9. Professional Development & Reflective Ethical Practice – 2 competencies.
10. Organizational Literacy & Adaptability – 4 competencies.

The in-depth interviews were semi-structured and were developed based on the WHO-ASPHER Competency Framework for the Public Health Workforce in the European Region (CFPHW tool). The framework enables standardization and consistent definition of the skills required by PH professionals. Questions were pretested to ensure a smooth flow of the interview and verify understanding of the questions in a pilot interview with two high-level PH managers. The researchers revised the questions accordingly, and an interview guide was formulated. The wording and order of the questions changed following the interview dynamics to maintain continuity and flow and encourage openness among the interviewees.

The interviews included personal details, questions regarding deficiencies in the current PH training, questions regarding the influence of COVID-19 on the PH workforce, the health system and community needs and requirements for improved field qualifications, and a question regarding the future of the PH profession and PH training in the changing world (Appendix B).

Data analyses

Survey data analysis was performed using IBM SPSS Statistics 25.0 software. Descriptive analysis was used to demonstrate current deficiency and sufficiency in the PH workforce in Israel. Distributions of responses were presented by skill level, organizations, and central and periphery areas in Israel.

In-depth interviews were transcribed and analyzed using a thematic analysis method. The analysis included deductive themes arising from the research topic and literature review on the PH qualifications and training and inductive themes that emerged from the data [Shkedi, 2003]. The content of the interviews was analyzed in several stages according to Shkedi's method: Initially, all interviews were read at least once to achieve an in-depth and comprehensive knowledge of the data. Next, we identified ideas, categories, and themes related to the study's purposes. Subsequently, we redefined main themes to include encoded quotes and examples based on re-reading the transcripts. Every passage that seemed relevant for the study purpose was marked as a findspot and allocated to one of the content themes. The researchers re-discussed the themes in the final stage while re-reading the transcripts until the last themes and sub-themes were formulated.

The study was approved by the Ashkelon Academic College Ethics Committee (Approval # 31-2021).

Results

Survey

Sample characteristics: The study included 49 participants who responded between August 17 and November 24, 2021. Of the survey respondents, 45% were Medical Doctors, 51% had a Master's degree in PH, and 20% were Ph.D. (Table 1). The most common workplaces were health departments or PH headquarters (51%), followed by other sections of the Ministry of Health and other governmental offices (29%). Hospitals, Health Maintenance Organizations (HMOs), Research institutes and Universities, Non-Governmental Organizations (NGOs), Non-Profit Organizations, and Private organizations were also represented. Respondents were predominantly female (67.3%). The majority of workplaces were geographically central, while 16% were located in Israel's periphery.

Table 1: Characteristics of sample

Characteristic	
Respondents, n	49
Sex, n (%)	
Male	16 (32.7)
Female	33 (67.3)
Educational Attainment, n (%)	
Bachelor's Degree	9 (18.4)
Master's Degree	21 (51.0)
Doctor of Philosophy (Ph.D.)	10 (20.4)
Doctor of Medicine (M.D.)	22 (44.9)
Organizations, n	
Hospitals	8
HMOs	6
Health Departments: Public Health Services Headquarters	25
Government: Ministry of Health Headquarters and Other Governmental Offices	14
Research Institutes: Universities	6
NGOs: Non-Profit Organizations, Private Organizations and Others	7
Region, n	
Central Israel	41
Peripheral Israel	8

Questions Complete	
Percent Mean (SD)	69.5 (36.5)
Percent Range	7-100
Responded to all chapters, %	73.5
Responded to 80% chapters, %	83.7

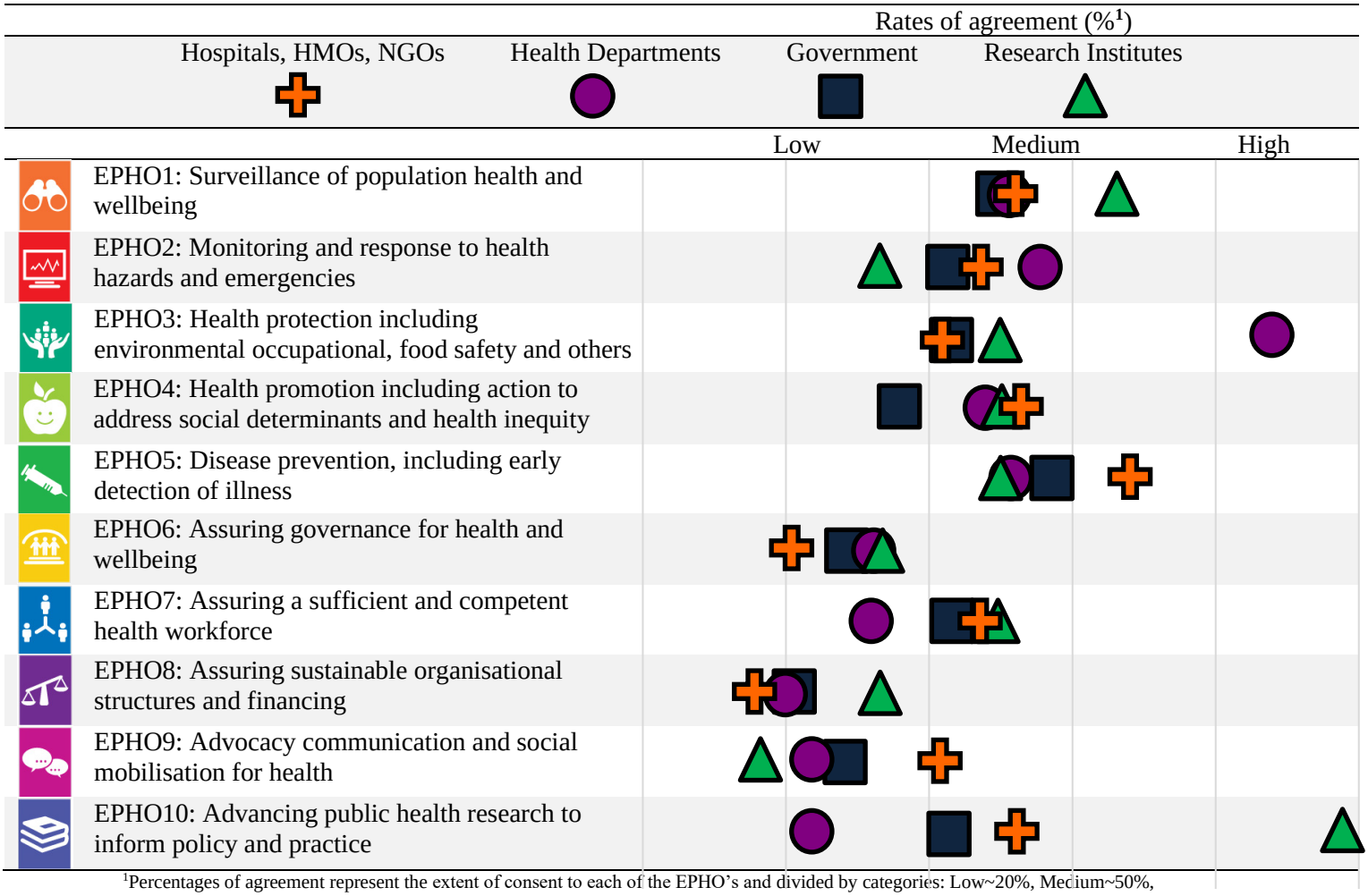
HMO- Health Maintenance Organization

NGO- Non-Governmental Organization

SD- Standard deviation

Essential Public Health Operations (EPHOs): Study participants were divided between those who work in the health department, headquarters of governmental offices (mainly, but not only in the Ministry of Health), research institutes, and other healthcare organization, such as hospitals, HMOs, and NGOs. This four-group analysis demonstrated a marked heterogeneity in specialization levels across the groups (Chart 1). All EPHOs were relevant, in various degrees to different organizations. However, some distinctions were identified between the level of relevance to the different organizations. For example, participants who were affiliated with research institutes addressed that EPHOs 1 and 10 "Surveillance of population health and wellbeing" and "Advancing public health research to inform policy and practice", respectively) were relatively more relevant to their core function in comparison with other institutions. Other PH professionals, who are employed by Health Departments indicated that EPHO 3 ("Health protection including environmental occupational, food safety and others") was relatively more needed to fulfill the professional responsibilities at their organisation. Those who work in hospitals, HMOs, and NGOs indicated that EPHOs 5 and 10 (“Disease prevention, including early detection of illness” and “Advancing public health research to inform policy and practice “, respectively) were more relevant for their core functions. On the flip side, among the least represented essential operations, in particular among hospitals, HMO, and NGO workers were EPHOs 6 and 8 ("Assuring governance for health and wellbeing" and "Assuring sustainable organizational structures and financing", respectively). A relatively lower level of organizational specialization was observed by professionals who work in governmental agencies. They demonstrated a relatively homogenous “medium” and “medium-low” affinity for each of the ten EPHOs.

Chart 1: Responses to "*Which Essential Public Health Operations (EPHOs) are most relevant to your organization*?"



[1]Percentages of agreement represent the extent of consent to each of the EPHO's and divided by categories: Low~20%, Medium~50%, High~80%.

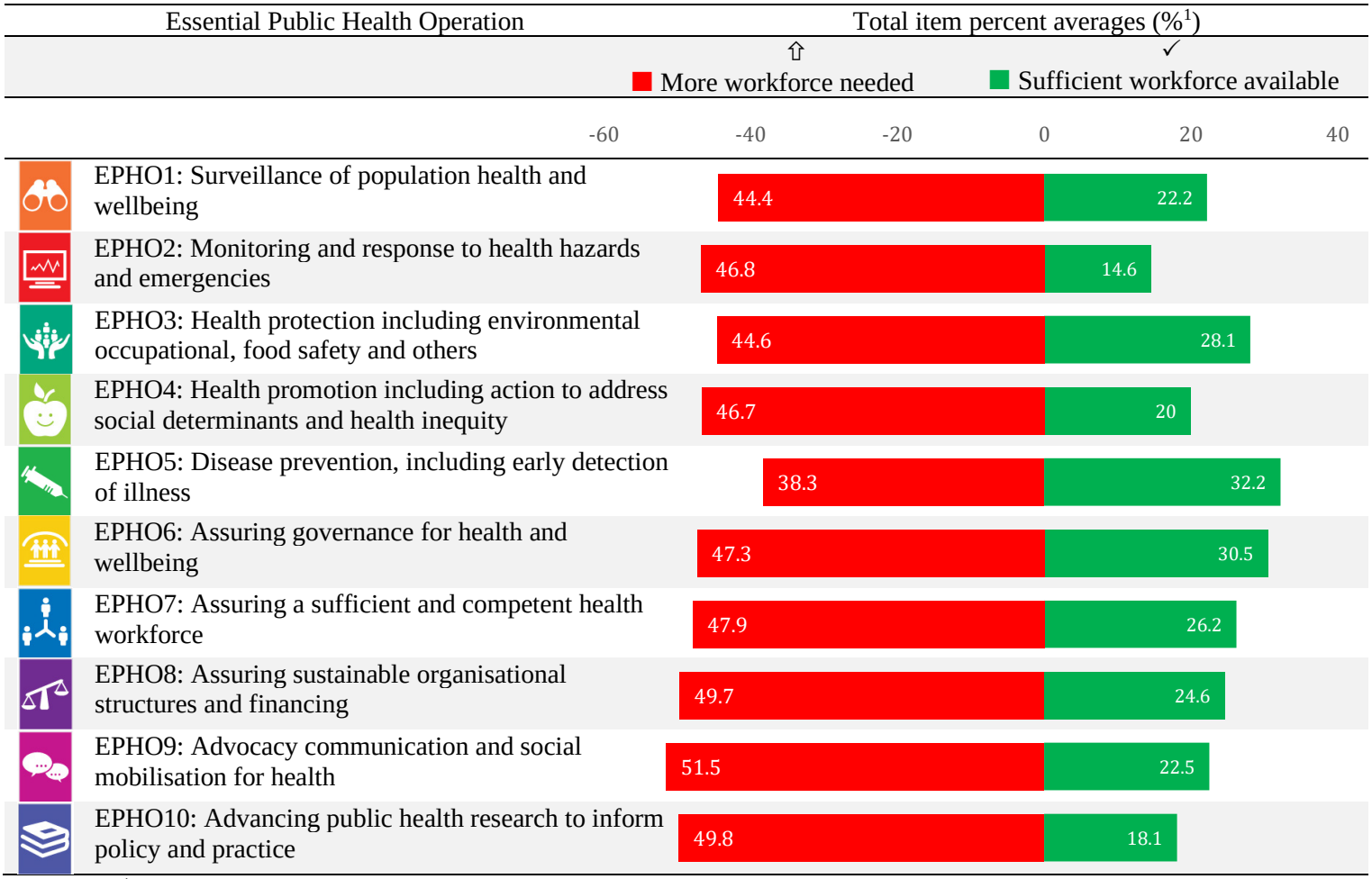
HMO- Health Maintenance Organization

NGO- Non Governmental Organization

The interrelatedness between the WHO-ASPHER Competency Framework and the WHO Essential Public Health Operations: Most of the survey's competency items in the framework were formulated so that they clearly mirrored specific EPHOs, allowing for a general glance at reported skill sufficiency and deficiency as they pertain to each of the ten specific operations (Chart 2). The outlook provided by this approach is that of a uniform skills deficiency across all EPHOs, at reported deficiency levels of 44.4 to 51.5 percent. A slightly lower deficiency of 38.3% was reported for EPHO 5 ("Disease prevention, including early detection of illness"). The reported skill demand is universally higher than reports of the sufficiency of qualified workers for each of the EPHOs, peaking at 32% for EPHO 5. Reported sufficiency was notably low at 14.6% for EPHO

2, "Monitoring and response to health hazards and emergencies", which is possibly influenced by COVID-19.

Chart 2: Essential Public Health Operations (EPHOs) Related Skill Deficiency and Sufficiency



[1]Response percent averages calculated for total number of survey items associated with each EPHO, based on the categorization described in Appendix A ("The interrelatedness of the WHO-ASPHER Competency Framework and the WHO Essential Public Health Operations")

Competencies demand by organizations: Chart 3 presents a "compass" of skilled workforce shortages in different organizational contexts, representing both the extent of deficiency and the specific area of competency shortages according to the WHO-ASPHER Competency Framework. Chart 4 completes the information and presents the rate of responders from different organizations, who referred to each of the skills as being deficient or sufficient.

Research Institutes: The highest reported deficiencies, across 9 out of 10 chapters, were reported by research institutes, the most significant shortages in Chapters 1-4, which include Science and Practice, Promoting Health, Law, Policy & Ethics, and One Health & Health Security (all included

under "Content & Context" competencies), as well as competencies relating to Leadership & Systems Thinking and Collaboration & Partnerships (Chart 3). As presented in chart 4, the reported shortage was slightly less severe for skills pertaining to communication, culture & advocacy (48.1%), but over one-half to two-thirds of respondents paint a bleak picture of widespread shortages in all other areas among this organization cluster (Chart 4).

Health Departments: Significant shortages in skilled workforce were also demonstrated by health departments, but unlike research institutes, deficiencies were mainly in Chapters 5-7 (all included under "Relations and Interactions" competencies), such as Leadership & Systems Thinking, Collaboration & Partnerships, and Communication, Culture & Advocacy skills (60.5%-62.9%). The single most highly demanded skill by health departments was "Identifying and describing the environmental factors that affect public health" (Table 4.1 in the appendices), followed by "Promoting projects and addressing barriers that may limit collaboration" (Table 6.1 in the appendices). Compared to other organizations, demand for Communication, Culture & Advocacy competencies was highest, by a margin, in health departments, which mostly required the "Ability to communicate with speakers and media people, identify target audiences, and develop messages" and "Ability to be interviewed in the media".

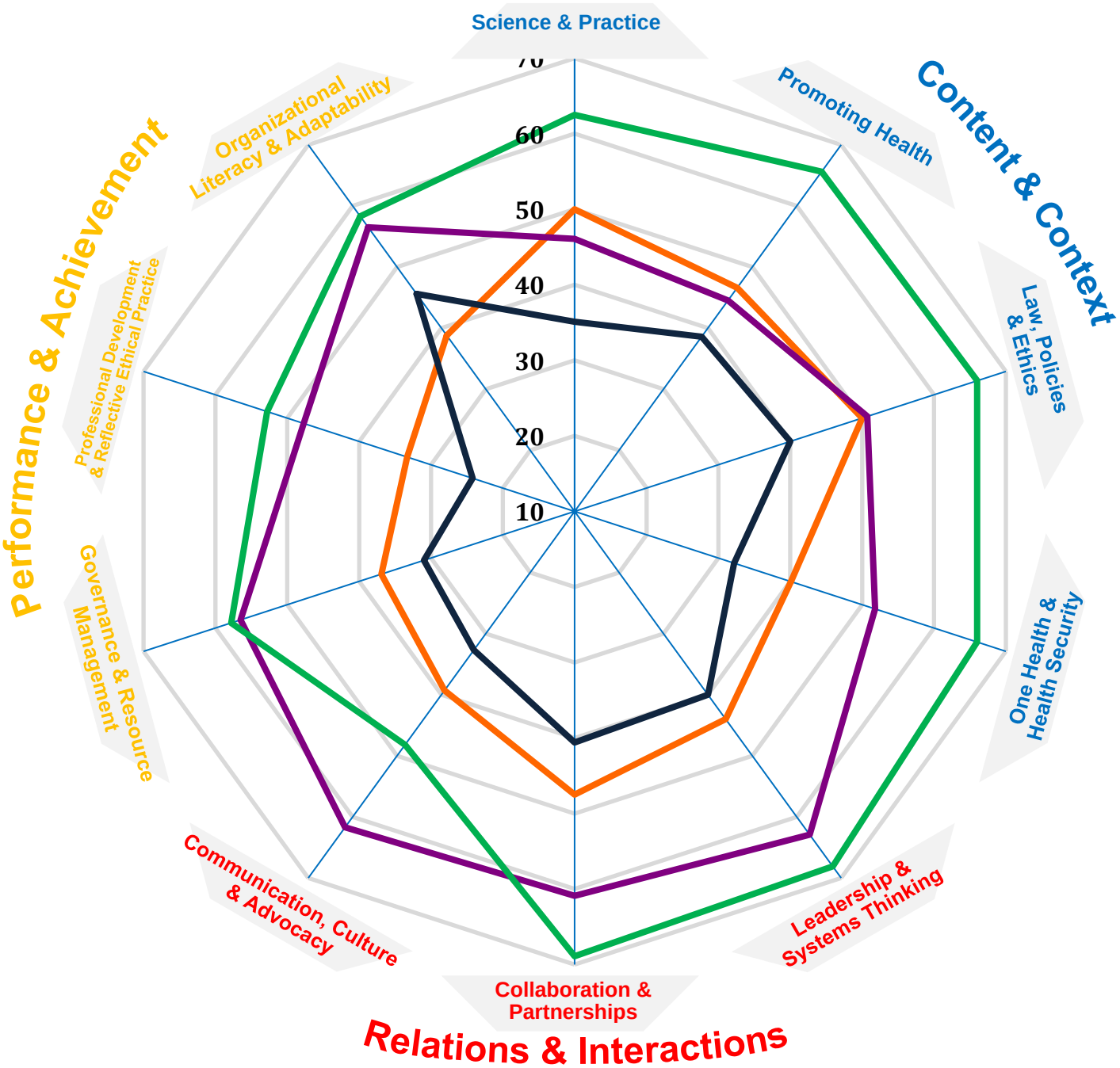
Government Agencies: Consisting mostly of the Ministry of Health, government Agencies reported the highest satisfaction from the competencies of their workforce, with only Organizational Literacy & Adaptability skills being frequently amiss (45.6%). More specifically, "Ability to deal with uncertainty and manage work-related stressful situations" was the highest demanded single skill in this Chapter (Table 10.1 in the appendices), and the most missing skill overall was "Promoting projects and addressing barriers that may limit collaboration" (Table 6.1 in the appendices). Professional Development & Reflective Ethical Practice was the most common sufficient qualification across all organizations, in particular in government agencies (54.5%).

Throughout the survey, the highest reported single sufficient skill was "Knowledge of the ethical codes relevant to their work" (Table 9 in the appendices), and in several instances reports of skill, sufficiency outweigh reports of skill shortages in this area of competency (Chart 4). A complete list of skill deficiency and sufficiency balances appears in Charts 1-3 in the appendices.

Chart 3: Overview of 10-Chapter Skill Deficiency, by Organizations

⇧ "More workforce needed" chapter percent averages (%[1])

■ Hospitals, HMOs, NGOs ■ Health Departments ■ Government ■ Research Institutes



[1]Response percent averages calculated for total items per chapter, each chapter consisted of 6 to 24 variables (2 to 8 items per Eco-FPHW workforce level classification).

Chart 4: Overview of 10-Chapter Skill Deficiency and Sufficiency, by Organizations

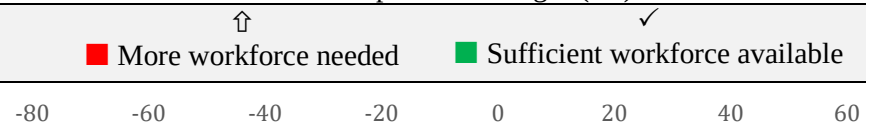
#	Chapter	Organizations	⇧ More workforce needed	✓ Sufficient workforce available
			Chapter percent averages (%[1])	
1	Science and Practice	Hospitals	50.6	15.5
		HMOs	40.3	29.2
		Health Departments	46.1	16
		Government	35.1	21
		Research Institutes	62.5	19.4
		NGOs	48.5	22.8
2	Promoting Health	Hospitals	50	15.6
		HMOs	46.7	30
		Health Departments	-44.2	12.7
		Government	38.6	13.4
		Research Institutes	65.6	23.4
		NGOs	40.6	34.4
3	Law, Policy & Ethics	Hospitals	50.8	33.8
		HMOs	33.3	48.9
		Health Departments	50.7	22.1
		Government	40	23.8
		Research Institutes	67.3	15.4
		NGOs	55.9	12.5
4	One Health & Health Security	Hospitals	45.4	20.8
		HMOs	29.8	28.1
		Health Departments	51.8	21.3
		Government	40	22.2
		Research Institutes	66	25
		NGOs	32.8	33.6
5	Leadership & Systems Thinking	Hospitals	45.8	15.3
		HMOs	38.3	26.7
		Health Departments	62.9	18.2
		Government	40	22.2
		Research Institutes	68.1	9.7
		NGOs	37.7	37.7
6	Collaboration & Partnerships	Hospitals	50.9	29.8
		HMOs	26.7	24.4
		Health Departments	60.5	27.1
		Government	40.6	29.2
		Research Institutes	68.9	13.3
		NGOs	56.4	15.4
7	Communication, Culture & Advocacy	Hospitals	40.4	8.5
		HMOs	34.8	33.3
		Health Departments	61.7	16.5
		Government	32.7	21.2
		Research Institutes	48.1	25.9
		NGOs	43.8	35.4
8	Governance & Resource Management	Hospitals	40.8	9.2
		HMOs	34.8	33.3
		Health Departments	56.5	21.8
		Government	31	29.8
		Research Institutes	57.8	17.8
		NGOs	28.8	38.8
9	Professional Development & Reflective Ethical Practice	Hospitals	42.9	42.9
		HMOs	36.7	53.3
		Health Departments	47.7	44.3
		Government	24.2	54.5
		Research Institutes	52.8	33.3
		NGOs	13.8	79.3
10	Organisational Literacy & Adaptability	Hospitals	45	35
		HMOs	43.3	40
		Health Departments	56.5	28.8
		Government	45.6	34.6
		Research Institutes	58.3	23.6
		NGOs	23.4	53.1

[1]Response percent averages calculated for total items per chapter, each chapter consisted of 6 to 24 variables (2 to 8 items per Eco-FPHW workforce level classification).

Competency by geography: Israel's geographic periphery faces difficulties in recruiting qualified medical professionals compared to central areas in the country. Similar phenomena was found in PH, as demonstrated in chart 5. Institutions in the periphery reported more deficiencies in nearly all competencies compared with the central parts of Israel. The most frequently reported missing competencies in the periphery were in Law, Policy & Ethics (72.7% *vs*. 47.6% in central Israel, respectively), and Collaboration & Partnerships (68.2% *vs*. 52.7% in central Israel, respectively). The exception was Organizational Literacy & Adaptability competencies, which were in greater demand in central Israel than in the periphery.

Chart 5: Overview of 10-Chapter Skill Deficiency and Sufficiency, by Regional Centre and Periphery

#	Chapter		Total item percent averages (%[1]) ⇧ More workforce needed / ✓ Sufficient workforce available
1	Science and Practice	Central Israel	44.7 / 21.1
		Peripheral Israel	59.5 / 20.3
2	Promoting Health	Central Israel	45.1 / 19.3
		Peripheral Israel	38.9 / 30.6
3	Law, Policy & Ethics	Central Israel	47.6 / 23.8
		Peripheral Israel	72.7 / 15.2
4	One Health & Health Security	Central Israel	43.6 / 25.5
		Peripheral Israel	54.2 / 2.1
5	Leadership & Systems Thinking	Central Israel	50.1 / 23.7
		Peripheral Israel	60
6	Collaboration & Partnerships	Central Israel	52.7 / 24.7
		Peripheral Israel	68.2 / 18.2
7	Communication, Culture & Advocacy	Central Israel	48.1 / 23.7
		Peripheral Israel	61.1 / 16.7
8	Governance & Resource Management	Central Israel	47.6 / 29.2
		Peripheral Israel	46.4 / 28.6
9	Professional Development & Reflective Ethical Practice	Central Israel	38.2 / 47.8
		Peripheral Israel	45.5 / 45.5
10	Organisational Literacy & Adaptability	Central Israel	53 / 30.2
		Peripheral Israel	38.1 / 28.6



[1]Response percent averages calculated for total items per chapter, each chapter consisted of 6 to 24 variables (2 to 8 items per Eco-FPHW workforce level classification).

Competency by Eco-FPHW workforce level classification: For each of the competencies, respondents were asked to specify the extent of deficiency in each of the different chapters by three levels of expertise - Entry, Competent, and Expert (Chart 6). Participants indicated deficiencies in all sections, but to a lesser extent in the professional development and reflective ethical practice.

Generally, the deficiency was greater commensurate with the level of expertise increase. Among Entry-level workers, the most demanded competencies were in Organizational Literacy & Adaptability (43.4%), with the highest demand for the single skill of "Ability to initiate and discover innovation, with unconventional solutions as well as thinking outside the box" (Table 10 in the appendices). Collaboration & Partnerships were the most requested competency among the Competent-level workforce (61.8%). This competency was also deficient in the Expert-level workforce (62.1%), along with Leadership & Systems Thinking competencies (62.7%). The most deficient single skill in the Competent workforce, mentioned by 74.3% of respondents, was "Promoting projects and addressing barriers that may limit collaboration" (Table 6 in the appendices). The three highest-mentioned specific skills in demand in the expert workforce were (refer to Tables 1, 5, and 6 in the appendices): "Designing and conducting qualitative and/or quantitative research which builds on existing evidence, involving relevant stakeholders in the research process" (75%), "Leading interdisciplinary teams in public health, including external stakeholders" (71.9%) and "Promoting projects and addressing barriers that may limit collaboration" (71.9%).

Chart 6: Overview of 10-Chapter Skill Deficiency and Sufficiency, by Workforce Level

#	Chapter	Eco-FPHW workforce level classification	Chapter percent averages (%[1]) ⇧ More workforce needed / ✓ Sufficient workforce available
1	Science and Practice	**Entry**	34.6 / 23.1
		Competent	55.3 / 17
		Expert	49.3 / 22.7
2	Promoting Health	**Entry**	42.6 / 21.7
		Competent	35.3 / 19
		Expert	47.5 / 22.6
3	Law, Policy & Ethics	**Entry**	44.3 / 23
		Competent	51.9 / 25.9
		Expert	54.9 / 19.6
4	One Health & Health Security	**Entry**	39.6 / 20.9
		Competent	44 / 27.8
		Expert	49.8 / 23.7
5	Leadership & Systems Thinking	**Entry**	35.8 / 23.9
		Competent	54.2 / 23.7
		Expert	62.7 / 19.9
6	Collaboration & Partnerships	**Entry**	38.9 / 24.1
		Competent	61.8 / 26.5
		Expert	62.1 / 22.1
7	Communication, Culture & Advocacy	**Entry**	41.6 / 16.8
		Competent	46.2 / 27.9
		Expert	59.4 / 25
8	Governance & Resource Management	**Entry**	39 / 24.9
		Competent	45.8 / 38
		Expert	58.7 / 24.5
9	Professional Development & Reflective Ethical Practice	**Entry**	38.6 / 42.9
		Competent	39.4 / 51.5
		Expert	37.7 / 49.2
10	Organisational Literacy & Adaptability	**Entry**	43.4 / 26.9
		Competent	55.2 / 35.3
		Expert	59.1 / 28.4

[1]Response percent averages calculated for total items per chapter, each respectively consisting of 2 to 8 items.

Qualitative analysis of in-depth interviews

Semi-structured in-depth interviews were conducted with thirty-one managers from various PH employers. Table 2 presents the seven main themes and sub-themes that emerged from the interviews.

Table 12 Themes and sub-themes of the in-depth interviews

Communication
•Communicating massages •Cultural adaptation of messages to the public
Health promotion
•Practice •Prevention
Leadership, management and partnership
•The conatct with public •The connection with government •The effect of COVID-19 pandemic on the status of PH
Workforce
•Headcounts •Work conditions
The link between the field and HEI
•Practical experience •Expanding teaching of PH •Promoting research
Innovation
•Technological innovation •Research innovation
The future of PH
•Adaptation to the changing world •Versatility

Theme 1: Communication skills

Communication skills include informing and influencing individuals, communities, and various audiences across essential health issues. Interviewees indicated that PH professionals should have stronger training in media interviews and be able to communicate scientific or complex ideas to a lay audience in different communities regarding the pandemic. Interviewee 19 explained: *"The pandemic emphasized the importance of communication training, dealing with politics, and the ability to portray effective messages. It was not for the first time; it simply highlighted the importance of these areas ever again…. All the preoccupation with information and involvement of politics in the field of public health - this is an area that needs more attention."* Interviewees also added that PH professionals should have better knowledge of how the media works, better respond to crisis events, be able to communicate key messages, deflect hostile questions, and have practical tools to be effective communicators. As interviewee 11 noted: *"Decision-makers have ignored us; they think the government is also an expert in epidemiology. We need more communication skills, knowledge to stand in front of an audience and communicate information to the public using different channels."*

Interviewees also suggested that messages should be culturally competent in different channels to diverse populations. As interviewee 11 noted: *"Communication skills are skills that need to be constantly maintained. We should identify communication skills required in the current period. Everyone is exposed to technology, but there are minority groups who do not use this technology. Training programs should not only identify risk groups but also should learn how to convey health messages to special populations."* Interviewee 30 depicted that message should also reach the geographical periphery: *"Even here in the region [periphery] I can say, I have not once heard on local radio, an interview with the district public health professional who explains the logic of governmental decisions regarding the pandemic. There is only the head of public health services in the media. It is not enough in the field. Not because they do not want to - but because they do not have sufficient skills to understand that their job is to speak to the public and transfer health knowledge to the public."*

Interviewees remarked that the expertise in health promotion is not sufficiently used, and therefore some mistakes were made in communicating health-promoting messages related to COVID-19 to the public. As interviewee 17 explained: *"The Ministry of Health and all its employees need to be better trained to work in health promotion. How to talk, how not to scare the public, and how to*

help people make the change. During the pandemic, they made all possible mistakes along the way and caused more opposition than could have been addressed otherwise."

Theme 2: Health Promotion

Participants addressed the prerequisite to expanding the practice of health promotion in the PH field and using practical tools for ongoing interventions. Interviewee 17 noted: *"I think health promotion needs more training and skills by using psychological methods, such as motivational tools, coaching, dynamic group facilitation skills. I mean all these practical tools that help people make the change, help them participate in the processes of change."* Interviewee 23 added: *"One of the things that need to be done is actually to plan and evaluate interventions. You teach this [in schools of PH, but you don't always do it in practice. Then if you do not do things, you are busy with day-to-day work, so sometimes things are forgotten. We must focus on planning health promotion interventions and plans adjusted to special populations."*

Interviewees noted that the health system is usually preoccupied with patients' treatment rather than prevention, and that the care for acute and chronic care overtook the resources needed for health education and promotion or program assessments. Many used the lessons learned from COVID-19 management and reported that more attention was needed in the prevention of viral transmission and identifying other health risks which are related to the pandemic, such as stress, loneliness, obesity, smoking, etc. Participants indicated that from their point, COVID-19 management lacked a holistic approach to avoid further negative health outcomes. Additionally, PH professionals should be more active in promoting physical activities, nutrition, and stress relief. Interviewee 6 emphasized: *"Public health has not been given the proper place. It is time for leaders to understand that more resources should be spent on prevention - it is much more effective than treating diseases. The pandemic did not help us so much because policymakers only dealt with treating patients…., and they forgot the real public health. Health promotion touches all areas and as such should be taught in any course and should be implemented in workplaces and not just in academia."*

Theme 3: Leadership, management, and partnership

Participants expressed concern at the level of leadership training and the ability of managers to enhance partnerships and collaborations. PH training should include foundations in management

and leadership to enable graduates to lead changes in the community. PH professionals should improve their contacts with the community and other health institutions and partner with local authorities and government agencies to identify health disparities and employ health interventions. Interviewee 15 explained: *"Making knowledge accessible to the public and creating a common language is very important, but I am also talking about the people who are in the health system, in the education system, in the system of other government ministries. We need partners to carry out all kinds of actions. For example, local authorities. So, if there is a lack of common language and common knowledge, that's a problem."* Interviewee 12 highlighted the importance of bi-directional communication between health departments and PH laboratories. Interviewee 26 said: *"We need to significantly expand the training in various areas and expand the services in the field of health promotion with the local authorities, strengthen this connection and turn it into something strongly organic. Because there is no doubt that local authorities have a very important role in health promotion."*

PH professionals managed the COVID-19 outbreak from the very beginning and were spotlighted by the media. The attention that PH received from the media was ambiguous: on the one hand, the public and politicians have been more aware of the central position PH are taking in health decisions and became acquainted with basic terms essentials epidemiology. On the other hand, part of the criticism regarding the quality of the decisions which were made by the political levels and the public frustration regarding the frequent changes were directed against PH professionals, even when the politicians were actually those who made the decisions. Interviewees also pointed out the possible negative aspects of using the Home Front Command of the Israeli Defense Forces to assist with the operation of the epidemiological investigations. Although the army relieved the workload in contact investigations, PH lost its dominance and influential part in leading the fight against COVID. Nevertheless, interviewees believed the central position of PH professionals at the MoH could improve their professional status in the medical community and anticipated that more resources will follow the increasing prestige. Interviewee 11 explained: *"Public health is a profession that should be at the forefront. But it suffers from terrible public relations, in my opinion. People do not come to study PH; people do not choose it as a profession. The COVID-19 crisis has trampled on the place of public health. I think it takes time and energy to push it forward. To raise public awareness and self-awareness as well. It is probably also our problem how we perceive ourselves and represent ourselves."*

Interviewees also mentioned that PH professionals at managerial positions should have improved skills in decisions making on a national scale under uncertainty. Traditionally, PH training includes evidence-based practice and decisions supported by strong epidemiological findings, however, the COVID-19 outbreak changed this paradigm. High-level PH officers had to make swift decisions on a national level without prior experience and based on partial information. As interviewee 21 noted: "*The COVID-19 crisis showed us all the important need to be well qualified in making decisions under conditions of uncertainty and pressure. To face not-so-simple objections and to know how to discriminate between the essential information and the non-essential."* Interviewee 4 added*: "Skills such as assertiveness and negotiation, leadership and tackling new national challenges, need to be strengthened."*

Theme 4: Workforce

All study interviewees indicated the necessity to invest more resources in the PH system and foster its workforce. They address the increasing demand for disease prevention, rapid responses to new health challenges, and improve contact with affected communities. The decline in the budget during the last decades made it difficult for the PH core to meet the routine needs, and these gaps became more significant during the COVID-19 outbreak. The PH system reached its insufficiency point early during the outbreak, which required reassigning of classic PH operations to other agencies while detaining all other routine health activities. Years of neglect of the PH system came to effect, living only partial response to the burning issue while generating workforce burnout. Moreover, other health organizations that provide health services, such as hospitals and health funds, do not train or employ PH professionals and therefore had to rely on the existing PH system, which failed to provide the anticipated responses.

All interviewees pointed out the need to train qualified workers, adapt capabilities to respond to the changing environment, improve employment conditions in the PH system, and raise the profession's reputation. Interviewee 15 stated: "*I think we need to strengthen public health services .... I'm talking about investing in manpower, training for more jobs, developing more job positions and roles."* Interviewee 21 added: *We must invest in human resources. Always. In choosing the people, in training the people. We need to create a vision, promote teamwork and collaborations within the organization, and establish team members."* It is vital to improve employment conditions, allocate resources to community interventions and open additional job positions. For

example, professional recognition of MPH graduates who are not medical professionals and allocate more positions for health-allied professionals. Other participants suggested supporting other health organizations to train and employ qualified PH practitioners (for example, hospitals medical insurers) and engaging young doctors and nurses to increase their professional interest in PH. This may also be in line with contemporary perception of the young generation of future employment, as they generally seek comfortable job conditions, work-family balance with an adequate salary, and as such the field of PH may not be attractive in this respect. Interviewee 22 said: *"The main problem of the profession, I think, is not the training - but the employment afterward. There are too few jobs in the field of public health. Not enough available positions, positions for interns, and experts. It's very hard."* And interviewee 12 added: *"We have a complicated problem today regarding the public health workforce. Public health has very negative public relations. Maybe due to COVID-19, but let's say that, in fact, at the end, when a doctor wants to choose a specialty or when a nurse wants to choose a specialty, Health Departments are not the first place they think of."*

Theme 5: The link between the field and Higher Education Institutes

This theme focused on the importance of a mutual linkage between the field level in PH and academic institutions. Interviewees raised the need to tailor the educational training to the practical changing needs of the community. Interviewee 19 pointed out the gap between training and the practice in the field: *"There are gaps between training and the field. Environmental epidemiology, water, and food interventions, or smoking are issues that are not been given enough attention during academic training. Health promotion is very much dependent on what district you work in. There is a large gap."*

The current PH system in Israel consists of a professional venue of health departments that provides community services and 2-to 3 research institutes, limiting the former's capability to conduct research in the community. Therefore, research in health departments is performed without supportive infrastructure, and carried out as self-initiatives. Interviewee 25 explained: "*We lack* a *skilled workforce in research, epidemiology, and statistics. We have an excellent, incredible database on diseases. We were the first to report the data on the Long Covid in the world. Unfortunately, I could not publish because I was missing people with research skills."* Research is a fine opportunity to strengthen the connection between academia and the field and make it a two-

way relationship while upgrading the PH system, raising the range of skills, and satisfying PH professionals. At the same time, lecturers from HEI can teach in the PH system and establish "in-service training" for staff while enhancing mutual fertilization. Continuous update of knowledge, ongoing teaching experience, and strengthening research skills will improve the professionalism of the PH workforce. PH and epidemiology professionals can also be empowered within the academy while teaching other student groups in allied areas, such as nursing, medicine, and other paramedical professions. Interviewee 2 noted: *"In training, there are not enough interfaces with other fields in medicine, not enough interfaces with doctors and therapists, there is the wrong separation."* The interviewees also recommended exposing students to the practice in the field during training by visiting organizations that provide PH services. They also suggested teaching in academic institutions will include problem-solving, facing dilemmas, and case studies rather than frontal teaching. Interviewee 10 emphasized: *"Training in public health must be related to an internship or practicum. Implementing practical internships in health departments or medical organizations is necessary. It is impossible to give an academic degree in PH without practical experience and research work."*

Theme 6: Innovation

PH is generally considered a conservative field in medicine, while other areas, such as surgery or pharmaceutics undergo frequent innovations. Interviewees in this study advised that the PH field should create a fresh atmosphere that encourages innovation-related competencies and supports new technologies to address contemporary challenges in PH, such as recurrent and emerging diseases, an increase in chronic morbidity, the implications of the widespread use of mobile phones, obesity among children, the aging population, climate changes and more. Interviewees recommended that academic training should include teaching content that is related to the ever-changing needs in PH while encouraging students to think "out of the box" and suggest creative solutions. Interviewees also proposed introducing innovative computer-based technology for collecting, managing, and processing data on morbidity and mortality. They also indicated that the limited technological infrastructure in PH was one of the major reasons for the early insufficiency of the PH system during the beginning of the COVID-19 outbreak in Israel. Interviewee 4 emphasized: *The whole digital issue needs significant improvement. The saddest thing is that Israel is well developed in terms of digital capabilities and technological innovation. Still, we are*

at the level of developing country in implementing innovative epidemiological technologies." Fostering a strong technological infrastructure is critical for rapid and professional decision-making. Interviewee 8 emphasized: *"I think one of the things we were missing, especially during the COVID-19 crisis, was the issue of information systems. Innovative software that can perform epidemiological calculations is critical, the future will use medical decision support systems, and it must be implemented in public health."* Interviewee 9 added: *"It is necessary to invest in innovation and create technical and other interfaces to map health status. We should get information about the populations' health; that should be the vision. This infrastructure should be extended to other diseases, not only infectious but also cancer, diabetes, even to the environmental-related health diseases."* Further development of informatics capabilities among PH professionals in big data was mentioned as significant to meet emerging challenges.

Theme 7: The future of public health

Participants indicated that PH should be more dynamic and adapt swiftly to the challenges of the changing world, such as climate change, risk management, and decision-making under conditions of uncertainty. Interviewee 12 noted: *"There is not much training on current issues such as the climate crisis and air quality. This is an issue that is less taught. The training concentrates greatly on basic epidemiology. It would be beneficial if there were further non-academic studies, as there are in all kinds of specializations."* Interviewees recommended that academic institutions would be more attentive to the new fields of interest and train the students to employ versatile responses and equip them with the appropriate tools to prevail the new challenges.

Facing the gap between the growing needs against the increasing demands for PH, many interviewees expressed concerns about the future of the PH profession and presented a pessimistic view. Interviewee 19 said: *"The basis of any organization is its workforce. Currently, in public health, the status of the profession is quite low. It reflects the low level of salary, but not only that, it also reflects the basic format of the profession which needs a change. We need to redefine the vision. I think we are in the middle of a deep crisis of public health workforce."* Interviewee 12 shared: *"I'm not very optimistic about the continuation of this whole profession of public health, as it is today. It is challenging to recruit staff. If you recruit staff, then the worker leaves quickly because other places pay better."*

Several interviewees suggested upgrading PH positions in terms of income, so they become more attractive, and also to open new PH positions in municipalities and other government agencies. In addition, reviving the conservative field of PH with research opportunities, networking with academia, and creating research and technological infrastructure in the PH system. Interviewee 30 explained: *"We have to grow, we have to get more power, to be involved in other aspects of health all the time. Not just during an epidemic. We must encourage public health professionals to present their opinions to the public on routine health issues, not just during an epidemic."* Interviewees emphasized the importance of mentoring students in PH organizations during their academic training period, encouraging periodic meetings with health professionals, and employing students in PH positions while exposing them to the diverse work in the field of PH.

Interviewees mentioned the interest and professional satisfaction they feel at work and facilitate change in the community while developing professionally within the health system.

Discussion

The dual data-collection approach utilized in this report, consisting of both an extensive electronic survey and semi-structured interviews demonstrates that more qualified workers from all expertise levels are required in the PH fields in Israel. PH professionals should be able to acquire and practice versatile capabilities in order to respond to the ever-changing threats in health and use innovative electronic infrastructure. In order to close the gap between the need to respond to health challenges with the limited resources and the shortage of staff, PH positions should be made more attractive. Better employment conditions in the PH system, a supportive working environment, better software, and electronic capabilities, as well as a stronger connection with academia could all bring a positive change in the attractiveness of the field. A synthesis of the two data sets may provide one appropriate tool for honing a lackluster professional identity, out of a complete toolkit geared towards ameliorating workforce shortcomings.

Research institutions and health departments showed the highest need for qualified PH professionals, especially at competent and expert levels. Medical institutions located at the periphery showed the greatest deficit in qualified professionals. Employers with diverse backgrounds demonstrate a need for *professionalism* in the required workforce. Namely, a need

for workers with extensive training, shared professional identity and potential for exchange of expertise, and ability to deal with increasingly specialized and diversified tasks.

One of the most neglected Essential Public Health Operations is "EPHO9: Advocacy communication and social mobilisation for health", for which most organizational clusters demonstrate a "Low" (~20%) relevance rate. The purpose of this EPHO is to use modern communication methods and technologies to support leadership and advocacy for community engagement and empowerment. Better communication in PH is one of the professional routes to ameliorate health literacy and improve the status of individuals and populations. Communication also enhances the populations' capacity to access, understand, and use the information to: reduce risk; prevent disease; promote health; and navigate and utilize health services. In health departments, and across all proficiency levels (Tables 7 and 7.1 in the appendices), high demand for better competency in "Communication, Culture & Advocacy" is reported (61.7% overall). This competencies group includes effective communication (written and verbal) including communication with the media, scientific communication, presentation, respect for diversity and inclusiveness, historical and cultural context, advocacy, and diplomacy.

The reported discrepancy between high PH communications skill demand and low essential PH operation relevance, may to some degree reflect that *de facto* the media profession is a distinct domain governed by players that are potentially foreign to PH. As noted in the qualitative segment, a relationship with the media is not new to PH but was very well exemplified during the COVID-19 pandemic. In managers' perceptions, PH professionals' position at the forefront as part of the National effort to manage the pandemic carried a possibility of improving the public image of their profession, while at the same time exposing them to foreign, even hostile reactions. Congruently, the most reported communication skill deficiency was the "Ability to be interviewed by the media. Better communication skills were also raised by many participants in the qualitative research. PH professionals, especially at the Expert levels should also be able to negotiate with high-level governmental officers and politicians and be able to defend their agendas also in a hostile environment.

Organizational Literacy & Adaptability competencies were in demand across all organizations, albeit with different foci at differing proficiency levels. This group of competencies includes the use of technology, data management, entrepreneurship, fundraising, creativity, analysis and synthesis, digital health and social media, understanding of PH services and operations. PH

professionals should be able to respond to current and emerging threats and to appropriate the response to the population at risk by using the proper channels of communication. Generally, skill deficiencies that appear at all proficiency levels include limited capacity in innovation and difficulty in "thinking out of the box". Despite the limited budget allocated to PH, and maybe because of the insufficient resources, PH professionals should develop a more flexible operation to respond and versatile use of the budget.

Other lacking competencies were related to funding-opportunities seeking. At the Competent and Expert levels, the most demanded skills were related to knowledge regarding funding opportunities and grant applications development and submission, especially in insearch institutes and health departments. This finding is indicative of a scientific culture that fosters applied research. Managements of PH institutions should support research at their institutions to promote innovations, increase staff satisfaction and establish a fruitful connection with other experts and institution's. Additionally, the concept of "shared, evolving knowledge" can be traced throughout several themes in the qualitative research (Themes 5, 6, and 7), demonstrating the scientific "hunger" to strengthen links between the PH field and higher education. In addition to research, PH professionals can be more involved in training students- both in PH programs and in allied medical fields and offer electives or temporary positions for students in their premises. This qualitative observation coincides with the finding that the "Ability to initiate and discover innovation, with unconventional solutions as well as thinking outside the box" is sought after by no less than 48.6% of survey respondents.

This study showed that medical institutions are lacking qualified PH professionals of all levels of training, in order to support PH system, academia should define the curricula to the need of the field level, and at the same time more positions should be opened in the PH system with higher income. Stronger staff with better knowledge will make the PH positions more attractive.

Conclusions

The aim of the current work package was to examine the field qualifications of the PH system in Israel. The adapted version of the WHO-ASPHER framework was thoroughly implemented. Collaboration & partnerships was identified as the top priority for hospitals, NGO's and for research institutes. Organisational literacy and adaptability were identified as the top priority for

HMOs and government agencies. Leadership & system thinking was identified as the top priority for health departments.

The multi-level aspect of the WHO-ASPHER framework revealed the high demand for competent and expert levels skills, showing Israel's geographic periphery is most disadvantaged with a qualified workforce compared to central areas in the country.

Key stakeholders addressed the need to improve communication skills, health promotion in theory and practice, leadership, and innovation. In addition, collaboration and partnership between the PH field and PH academic training were mentioned as vital for the development of a well-qualified PH workforce.

Summary of Recommendations

The study findings reveal the need for the necessary changes in PH training to respond to the needs of the changing world. Based on the results, the following recommendations for advancing the skills and competencies in PH are proposed:

1. It is recommended to define the PH profession to include a variety of roles and training options. Furthermore, there is a need for establishing a task force responsible for regulating and facilitating the PH profession, including job conditions, positions, professional development, and public and governmental status.
2. PH training in Israel should be defined in all education levels (BA, MPH, and Ph.D.) to reflect deficiencies and qualification needs identified in the current analyses. For example, to emphasize communication, culture, and advocacy competencies among BA training programs. Science and practice competencies among MPH training programs, and leadership and system thinking competencies among Ph.D. training programs.
3. It is recommended to establish "in-service training" for the current workforce, maintain continuous updates of knowledge, ongoing teaching experience, and strengthen research skills to improve the PH workforce's professionalism.
4. Gaps in the competent and expert level workforce should be filled in the geographical periphery of Israel.
5. Ongoing cooperation between the field and PH academic training programs should be strengthened.

6. Performing organizational and employees' competencies self-assessment and gap analyses periodically to enable better meet the community needs.
7. Special attention should be given to the development of PH competencies related to minorities and special populations: leading factors for inequality in health, community-based health needs assessments among special populations, and cultural adaptation of health messages.

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Appendices

Appendix A

Public Health workforce competencies survey

Dear participant,

This survey is conducted as part of a broad project funded by the European Union (Erasmus+) and aims to examine the level of compatibility of the content taught in various programs in public health with the skills and competencies required in the workplaces that employ public health professionals in Israel. The survey findings will enable the adaptation of existing curricula to the needs of the employment market.

The questionnaire is anonymous, and the answers will remain confidential. For more information, please contact Dr. Osnat Bashkin, Department of Public Health at Ashkelon Academic College, obashkin@gmail.com.

The survey consists of 11 chapters. The first chapter includes several demographic questions related to your occupation. The following ten chapters describe 43 different skills and competencies relevant to public health.

We would appreciate your time to complete the survey and respond to all parts. The survey takes about 20 minutes to complete.

Thank you very much for your cooperation!

Part One- Demographic questions

1. What is your highest level of education (mark more than one option if needed):1. Bachelor's degree 2? Master's degree 3. Doctorate Degree Ph.D. 4. MD 5. Other_____
2. Do you have an MPH? 1. Yes 2. No

3. What is your profession: 1. Medicine with a specialty in Public Health; 2. Medicine with another specialty; 3. Nursing; 4. Nutrition; 5. Economics/ political science; 6. Human resources; 7. Epidemiology; 8. Health Promotion; 9. Research; 10. Other_____
4. Years of employment in your workplace: _____
5. What is the number of your direct subordinates?
6. How many of them are working in public health? 1. 25% max; 2. 25- 50%; 3. 50-75%; 4. 75% or more
7. What percentage of your workers have a degree in public health? 1. 0-25%; 2. 25-50%; 3. 50-75%; 4. 75% and up
8. Do you manage a budget as part of your on-job responsibility? 1. Yes, 2. No
9. The organization you work at: 1. Hospital_____; 2. Clinic _____; 3. Government Office; 4. Non-profit organization; 5. Private Company; 6. Municipality; 7. Department of Health_____; 8. Public Health Services; 9. Ministry of Health headquarters; 10. University_____;11. Research institute _____
10. The nature of your work: 1. Health management; 2. Research; 3. Clinical practitioner; 4. Other
11. Please select from the following list the main functions your organization deals with. You can mark several functions or all of them:

EPHO1: Surveillance of population health and wellbeing.

EPHO2: Monitoring and response to health hazards and emergencies.

EPHO3: Health protection including environmental occupational, food safety and others.

EPHO4: Health promotion including action to address social determinants and health inequity.

EPHO5: Disease prevention, including early detection of illness.

EPHO6: Assuring governance for health and wellbeing.

EPHO7: Assuring a sufficient and competent health workforce.

EPHO8: Assuring sustainable organisational structures and financing.

EPHO9: Advocacy communication and social mobilisation for health.

EPHO10: Advancing public health research to inform policy and practice.

Part Two- Public Health competencies

In the following sentences in the questionnaire, several competencies relevant to public health will be listed. For each of the competencies, we will ask you to rate if you think that more workforce holding the described competency is needed, or if there is currently enough workforce holding the described competency in the organization or unit to which you belong, in each of three levels of expertise - Entry, Competent, and Expert. If this competency is not relevant at all in your unit, please check "This competency is not relevant in the unit."

1. Science & Practice

1.1 Recognition of the features of demographic structure in the society/community in Israel and understanding the process of demographic change and its implications for public health.

1.2 Description of the factors influencing morbidity and mortality in the population in the area of deployment of the unit.

1.3 Uses of vital statistics and health indicators effectively to assess the health state population, including at-risk groups.

1.4 Evaluation of community-based health needs assessments.

1.5 Designing and conducting qualitative and quantitative research builds on existing evidence, involving relevant stakeholders in the research process.

1.6 Understand the health system structure, governance, funding mechanisms, and how healthcare services are organized.

1.7 Knowledge of guidelines regarding disaster control and prevention of pandemics.

1.8 Participation in drafting guidelines regarding disaster control and prevention of pandemics.

2. Promoting health

2.1 Development of health promotion programs designed to improve the community's health and quality of life.

2.2 Presentation and dissemination of information related to the promotion of health in the community, such as encouraging proper nutrition, physical activity, cessation of smoking, reduction in alcohol consumption, etc.

2.3 Recognition and consideration of the leading factors for inequality in health.

2.4 Knowledge of various risk behaviors and addressing their consequences (such as drug use, unprotected sex, smoking, and alcohol consumption).

3. Law, Policy & Ethics

3.1 Recognition, understanding, and application of health protocols, laws, and procedures.

3.2 Understanding principles and concepts in public health and preparing background documents for discussion of administrative, legal, and social issues related to public health.

3.3 Taking an active part in implementing policies that ensure the provision of equal health services.

4. One Health & Health Security

4.1 Understanding the significance of the One Health approach and its impact on the health status of the population.

4.2 Knowledge of International Health Regulations (IHR).

4.3 Development of partnerships at the international level.

4.4 Understanding and promoting areas of safety, health, and well-being of employees in the workplace.

4.5 Knowledge of the practical principles of food safety.

4.6 Knowledge of the practical principles of healthy eating.

4.7 Knowledge of diseases that vaccines can prevent and encourage vaccination.

4.8 Identifying and describing the environmental factors that affect public health.

5. Leadership & Systems Thinking

5.1 Encouraging and motivating others to promote a shared vision and outline organizational goals.

5.2 Ability to serve as a model to emulate, build trust, and demonstrate sensitivity to the belief system and values of the other.

5.3 Leading interdisciplinary teams in public health, including external stakeholders.

5.4 Promoting change (behavioral and cultural) in the organization, in communities and in individuals.

6. Collaboration & Partnerships

6.1 Maintaining working relationships with stakeholders in interdisciplinary and cross-sectorial projects to improve health services and achieve public health goals.

6.2 Maintaining working relationships with other departments in the Ministry of Health /Hospitals/HMOs and with other agencies, such as local authorities, the Standards Institute, the Central Bureau of Statistics, other government ministries, the third sector, and relevant Knesset committees, and more.

6.3 Promoting projects and addressing barriers that may limit collaboration.

7. Communication, Culture & Advocacy

7.1 Ability to communicate with speakers and media, identify target audiences, and develop messages.

7.2 Promoting health messages through media and social marketing to different audiences and adapting the messages so that they are culturally appropriate.

7.3 Ability to be interviewed in the media.

8. Governance & Resource Management

8.1 Managing employees efficiently, providing clear instructions regarding task responsibilities, ensuring training, adequate resources, and providing regular performance feedback.

8.2 Effective planning of the assignment of work tasks in order to achieve the goals set by the organization.

8.3 Detailing job descriptions to promote staff absorption, conducting interviews and evaluating candidates.

8.4 Knowledge of the principles of economic thinking in public health.

8.5 Ability to apply economic principles in public health.

9. Professional Development & Reflective Ethical Practice

9.1 Knowledge of the ethical codes relevant to their work.

9.2 Ability to initiate activities for the professional development and advancement of the employees in the organization.

10. Organisational Literacy & Adaptability

10.1 Ability to initiate and discover innovation with unconventional solutions and think outside the box.

10.2 Ability to deal with uncertainty and manage work-related stressful situations.

10.3 Ability to manage time well - allocating time frames for the fulfillment of tasks and working with deadlines.

10.4 Awareness and knowledge in applying available funding\ sources, development, and submission of applications and grants for projects and calls for projects.

The interrelatedness of the WHO-ASPHER Competency Framework and the WHO Essential Public Health Operations

EPHO1: Surveillance of population health and wellbeing: 1.1., 1.2., 1.3., 1.4., 2.2., 2.3.

EPHO2: Monitoring and response to health hazards and emergencies: 4.1., 4.2., 4.3.

EPHO3: Health protection including environmental occupational, food safety and others: 3.1., 4.1., 4.4., 4.5., 4.6., 4.7., 4.8.

EPHO4: Health promotion including action to address social determinants and health inequity: 2.1., 2.4., 3.3., 5.4.

EPHO5: Disease prevention, including early detection of illness: 2.4., 4.4., 4.7.

EPHO6: Assuring governance for health and wellbeing: 3.1., 3.2., 3.3., 6.2., 9.1., 10.3.

EPHO7: Assuring a sufficient and competent health workforce: 1.7., 1.8., 5.1., 5.2., 5.3., 8.2., 8.3., 9.2., 10.2.

EPHO8: Assuring sustainable organisational structures and financing: 1.6., 3.2., 8.4., 8.5., 10.1., 10.4.

EPHO9: Advocacy communication and social mobilisation for health: 2.1., 6.1., 6.2., 6.3., 7.1., 7.2., 7.3.

EPHO10: Advancing public health research to inform policy and practice: 1.3., 1.5., 2.3.

Appendix B

Interview guide - Public Health workforce competencies and the field needs

1. Thank you for consent to be interviewed. Please tell me a little about yourself, where do you work, how many years are you holding your position, how many years you work as a manager in the PH field?
2. How many employees do you have in your current position?
3. I would like to ask you if you think there is a deficiency or sufficiency in terms of a competent workforce in several main areas essential to PH, such as:
    a. Science skills
    b. Health Promotion skills.
    c. Law, Policy & Ethics skills.
    d. One Health & Health Security skills.
    e. Leadership & Systems Thinking skills.
    f. Collaboration & Partnerships skills.
    g. Communication, Culture & Advocacy skills.
    h. Governance & Resource Management skills.
    i. Professional Development & Reflective Ethical Practice skills.

j. Organizational Literacy & Adaptability skills.

4. Are there any other points/issues you think that currently do not have adequate training for public health workers?
5. Do you think the COVID-19 has revealed the need for new skills and competencies required of public health workers?
6. How do you see the PH services in the future? What would you choose to invest more in? What barriers exist today for the development of the PH service, in your opinion?

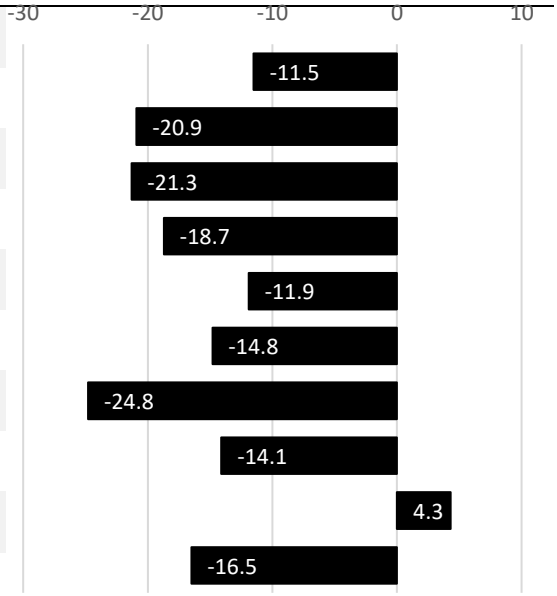
Appendix C

Additional Survey Data Tables and Charts

1. Charts providing overviews of skill sufficiency and deficiency by workforce level:

Appendix Chart 1: Overview of 10-Chapter Skill Deficiency and Sufficiency in "Entry" Workforce Level

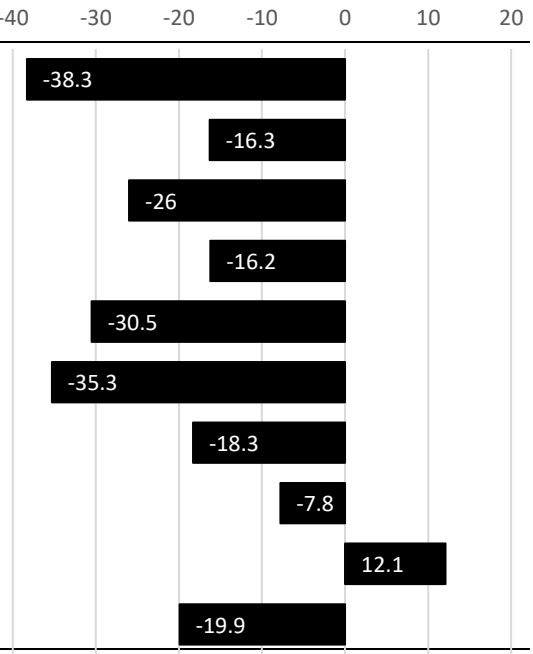
#	Chapter	Chapter percent averages (%)[1] ✓ Sufficient workforce available	⇧ More workforce needed	Skill deficiency and sufficiency balance
	"Entry" workforce skills			
1	Science and Practice	23.1	34.6	-11.5
2	Science and Practice Skills	21.7	42.6	-20.9
3	Law, Policy & Ethics	23	44.3	-21.3
4	One Health & Health Security	20.9	39.6	-18.7
5	Leadership & Systems Thinking	23.9	35.8	-11.9
6	Collaboration & Partnerships	24.1	38.9	-14.8
7	Communication, Culture & Advocacy	16.8	41.6	-24.8
8	Governance & Resource Management	24.9	39.0	-14.1
9	Professional Development & Reflective Ethical Practice	42.9	38.6	4.3
10	Organisational Literacy & Adaptability	26.9	43.4	-16.5



[1]Response percent averages calculated for total items per chapter, each respectively consisting of 2 to 8 items.

Appendix Chart 2: Overview of 10-Chapter Skill Deficiency and Sufficiency in "Competent" Workforce Level

#	Chapter	Total item percent averages (%)[1] ✓ Sufficient workforce available	⇧ More workforce needed	Skill deficiency and sufficiency balance
	"Entry" workforce skills			
1	Science and Practice	17.0	55.3	-38.3
2	Science and Practice Skills	19.0	35.3	-16.3
3	Law, Policy & Ethics	25.9	51.9	-26
4	One Health & Health Security	27.8	44.0	-16.2
5	Leadership & Systems Thinking	23.7	54.2	-30.5
6	Collaboration & Partnerships	26.5	61.8	-35.3
7	Communication, Culture & Advocacy	27.9	46.2	-18.3
8	Governance & Resource Management	38.0	45.8	-7.8
9	Professional Development & Reflective Ethical Practice	51.5	39.4	12.1
10	Organisational Literacy & Adaptability	35.3	55.2	-19.9



[1]Response percent averages calculated for total items per chapter, each respectively consisting of 2 to 8 items.

Appendix Chart 3: Overview of 10-Chapter Skill Deficiency and Sufficiency in "Expert" Workforce Level

#	Chapter	✓ Sufficient workforce available	⇧ More workforce needed	Total item percent averages (%)[1] Skill deficiency and sufficiency balance
	"Expert" workforce skills			-50 -30 -10 10
1	Science and Practice	22.7	49.3	-26.6
2	Science and Practice Skills	22.6	47.5	-24.9
3	Law, Policy & Ethics	19.6	54.9	-35.3
4	One Health & Health Security	23.7	49.8	-26.1
5	Leadership & Systems Thinking	19.9	62.7	-42.8
6	Collaboration & Partnerships	22.1	62.1	-40
7	Communication, Culture & Advocacy	25.0	59.4	-34.4
8	Governance & Resource Management	24.5	58.7	-34.2
9	Professional Development & Reflective Ethical Practice	49.2	37.7	11.5
10	Organisational Literacy & Adaptability	28.4	59.1	-30.7

[1]Response percent averages calculated for total items per chapter, each respectively consisting of 2 to 8 items.

2. Data tables and charts divided by chapter :

   a. Chapter 1: Science and Practice

Appendix Table 1: Overview of Reported *Science and Practice* Skills Availability, by Workforce Level

#	Listed skill/ability	Eco-FPHW workforce level classification	n[1]	✓ Sufficient workforce available	⇧ More workforce needed	✖ This skill is not relevant in the unit
1.1	Recognition of the features of demographic structure in the society/community in Israel and understanding the process of demographic change and its implications for public health.	**Entry**	40	35.0	32.5	32.5
		Competent	37	18.9	54.1	27.0
		Expert	35	22.9	45.7	31.4
1.2	Description of the factors influencing morbidity and mortality in the population in the area of deployment of the unit.	**Entry**	39	25.6	35.9	38.5
		Competent	35	25.7	51.4	22.9
		Expert	35	28.6	45.7	25.7
1.3	Uses of vital statistics and health indicators effectively to assess the health state population, including at-risk groups.	**Entry**	39	20.5	41.0	38.5
		Competent	35	20.0	60.0	20.0
		Expert	34	26.5	47.1	26.5
1.4	Evaluation of community based health needs assessments.	**Entry**	38	23.7	28.9	47.4
		Competent	35	11.4	57.1	31.4
		Expert	35	17.1	54.3	28.6
1.5	Designing and conducting qualitative and/or quantitative research which builds on existing evidence, involving relevant stakeholders in the research process.	**Entry**	38	15.8	36.8	47.4
		Competent	35	8.6	62.9	28.6
		Expert	36	8.3	75.0	16.7
1.6	Understands the health system structure, its governance, funding mechanisms and how healthcare services are organised	**Entry**	39	35.9	23.1	41.0
		Competent	34	26.5	47.1	26.5
		Expert	34	41.2	26.5	32.4
1.7	Knowledge of guidelines regarding disaster control and prevention of pandemics.	**Entry**	40	15.0	42.5	42.5
		Competent	35	14.3	57.1	28.6
		Expert	34	20.6	47.1	32.4
1.8	Participation in the drafting of guidelines regarding disaster control and prevention of pandemics.	**Entry**	39	12.8	35.9	51.3
		Competent	36	11.1	52.8	36.1
		Expert	35	17.1	51.4	31.4
	Science and Practice percent averages	**Entry**		23.1	34.6	42.3
		Competent		17.0	55.3	27.7
		Expert		22.7	49.3	28.1

[1]Number of responses varied across skill items and described Eco-FPHW workforce levels.

Appendix Table 1.1: Reported *Science and Practice* Skills Deficiencies, by Organizations

#	Listed skill/ability	Organizations	⇧ More workforce needed (%[1]) ☐ Entry ■ Competent ■ Expert
1.1	Recognition of the features of demographic structure in the society/community in Israel and understanding the process of demographic change and its implications for public health.	Hospitals	29 71 57
		HMOs	50 50 67
		Health Departments	32 53 36
		Government	27 33 18
		Research Institutes	33 83 50
		NGOs	33 83 67
1.2	Description of the factors influencing morbidity and mortality in the population in the area of deployment of the unit.	Hospitals	29 71 86
		HMOs	33 33 33
		Health Departments	47 50 50
		Government	25 58 36
		Research Institutes	33 33 33
		NGOs	17 57 50
1.3	Uses of vital statistics and health indicators effectively to assess the health state population, including at-risk groups.	Hospitals	43 57 71
		HMOs	50 33 50
		Health Departments	39 62 43
		Government	27 55 40
		Research Institutes	33 83 67
		NGOs	33 71 67
1.4	Evaluation of community based health needs assessments.	Hospitals	14 57 71
		HMOs	50 67 50
		Health Departments	25 39 57
		Government	17 46 27
		Research Institutes	17 83 67
		NGOs	20 67 80
1.5	Designing and conducting qualitative and/or quantitative research which builds on existing evidence, involving relevant stakeholders in the research process.	Hospitals	14 71 86
		HMOs	33 50 67
		Health Departments	43 58 71
		Government	25 42 67
		Research Institutes	17 100 83
		NGOs	20 67 80
1.6	Understands the health system structure, its governance, funding mechanisms and how healthcare services are organised	Hospitals	29 71 43
		HMOs	17 17
		Health Departments	25 50 23
		Government	25 33 27
		Research Institutes	33 17 50
		NGOs	17 60 20
1.7	Knowledge of guidelines regarding disaster control and prevention of pandemics.	Hospitals	14 43 57
		HMOs	50 50 17
		Health Departments	59 69 46
		Government	25 42 36
		Research Institutes	67 100 83
		NGOs	17 60 20
1.8	Participation in the drafting of guidelines regarding disaster control and prevention of pandemics.	Hospitals	14 57 71
		HMOs	33 33 33
		Health Departments	53 46 43
		Government	33 42 36
		Research Institutes	50 100 83
		NGOs	20 83 40

[1]Percentages out of total responses per Eco-FPHW workforce level classification.

b. Chapter 2: Promoting Health

Appendix Table 2: Overview of Reported *Promoting Health* Skills Availability, by Workforce Level

#	Listed skill/ability	Eco-FPHW workforce level classification	n[1]	✓ Sufficient workforce available	⇧ More workforce needed	✖ This skill is not relevant in the unit
2.1	Development of health promotion programs, designed to improve the health and quality of life of the community.	**Entry**	37	16.2	40.5	43.2
		Competent	34	14.7	58.8	26.5
		Expert	34	14.7	58.8	26.5
2.2	Presentation and dissemination of information related to the promotion of health in the community, such as encouraging proper nutrition, physical activity, cessation of smoking, reduction in alcohol consumption, etc.	**Entry**	37	24.3	32.4	43.2
		Competent	36	22.2	41.7	36.1
		Expert	34	11.8	50.0	38.2
2.3	Recognition and consideration of the leading factors for inequality in health.	**Entry**	37	18.9	35.1	45.9
		Competent	33	24.2	42.4	33.3
		Expert	34	20.6	50.0	29.4
2.4	Knowledge of various risk behaviors and addressing their consequences (such as drug use, unprotected sex, smoking and alcohol consumption).	**Entry**	36	16.7	33.3	50.0
		Competent	34	29.4	47.1	23.5
		Expert	34	29.4	47.1	23.5
	Promoting Health percent averages	**Entry**		21.7	42.6	33.9
		Competent		19.0	35.3	45.5
		Expert		22.6	47.5	29.9

[1]Number of responses varied across skill items and described Eco-FPHW workforce levels.

Appendix Table 2.1: Reported *Promoting Health* Skills Deficiencies, by Organizations

#	Listed skill/ability	Organizations	⇧ More workforce needed (%[1]) ☐ Entry ■ Competent ■ Expert
2.1	Development of health promotion programs, designed to improve the health and quality of life of the community.	Hospitals	20 / 60 / 67
		HMOs	80 / 60 / 60
		Health Departments	50 / 54 / 46
		Government	9 / 40 / 70
		Research Institutes	20 / 100 / 83
		NGOs	20 / 67 / 80
2.2	Presentation and dissemination of information related to the promotion of health in the community, such as encouraging proper nutrition, physical activity, cessation of smoking, reduction in alcohol consumption, etc.	Hospitals	20 / 40 / 67
		HMOs	20 / 20 / 40
		Health Departments	50 / 50 / 54
		Government	27 / 36 / 40
		Research Institutes	60 / 80 / 67
		NGOs	40 / 50 / 40
2.3	Recognition and consideration of the leading factors for inequality in health.	Hospitals	40 / 60 / 83
		HMOs	40 / 20 / 40
		Health Departments	33 / 42 / 46
		Government	46 / 36 / 40
		Research Institutes	40 / 60 / 67
		NGOs	33 / 20 / 40
2.4	Knowledge of various risk behaviors and addressing their consequences (such as drug use, unprotected sex, smoking and alcohol consumption).	Hospitals	20 / 40 / 67
		HMOs	60 / 60 / 60
		Health Departments	20 / 50 / 39
		Government	36 / 36 / 50
		Research Institutes	80 / 80 / 50
		NGOs	20 / 33 / 40

[1]Percentages out of total responses per Eco-FPHW workforce level classification.

c. Chapter 3: Law, Policy & Ethics

Appendix Table 3: Overview of Reported *Law, Policy & Ethics* Skills Availability, by Workforce Level

#	Listed skill/ability	Eco-FPHW workforce level classification	n[1]	✓ Sufficient workforce available	⇧ More workforce needed	✖ This skill is not relevant in the unit
3.1	Recognition, understanding and application of health protocols, laws and procedures.	**Entry**	36	30.6	50.0	19.4
		Competent	37	29.7	62.2	8.1
		Expert	34	20.6	52.9	26.5
3.2	Understanding principles and concepts in public health and preparing background documents for discussion of administrative, legal and social issues related to public health.	**Entry**	38	18.4	55.3	26.3
		Competent	37	24.3	56.8	18.9
		Expert	34	23.5	61.8	14.7
3.3	Taking an active part in the implementation of policies that ensure the provision of equal health services.	**Entry**	39	20.5	28.2	51.3
		Competent	34	23.5	35.3	41.2
		Expert	34	14.7	50.0	35.3
	Law, Policy & Ethics percent averages	**Entry**		23.0	44.3	32.7
		Competent		25.9	51.9	22.2
		Expert		19.6	54.9	25.5

[1]Number of responses varied across skill items and described Eco-FPHW workforce levels.

Appendix Table 3.1: Reported *Law, Policy & Ethics* Skills Deficiencies, by Organizations

#	Listed skill/ability	Organizations	⇧ More workforce needed (%[1]) ☐ Entry ■ Competent ■ Expert
3.1	Recognition, understanding and application of health protocols, laws and procedures.	Hospitals	43 63 57
		HMOs	20 40 20
		Health Departments	67 60 50
		Government	46 62 36
		Research Institutes	40 83 67
		NGOs	40 83 40
3.2	Understanding principles and concepts in public health and preparing background documents for discussion of administrative, legal and social issues related to public health.	Hospitals	43 43 57
		HMOs	40 40 60
		Health Departments	67 56 50
		Government	42 42 46
		Research Institutes	60 83 67
		NGOs	67 80 80
3.3	Taking an active part in the implementation of policies that ensure the provision of equal health services.	Hospitals	38 43 71
		HMOs	20 20 40
		Health Departments	33 53 43
		Government	17 25 46
		Research Institutes	33 83 83
		NGOs	14 43

[1]Percentages out of total responses per Eco-FPHW workforce level classification.

d. Chapter 4: One Health & Health Security

Appendix Table 4: Overview of Reported *One Health & Health Security* Skills Availability, by Workforce Level

#	Listed skill/ability	Eco-FPHW workforce level classification	n[1]	✓ Sufficient workforce available	⇧ More workforce needed	✖ This skill is not relevant in the unit
4.1	Understanding the significance of the One Health approach and its impact on the health status of the population.	**Entry**	35	20.0	31.4	48.6
		Competent	33	24.2	42.4	33.3
		Expert	32	18.8	53.1	28.1
4.2	Knowledge of International Health Regulations (IHR).	**Entry**	37	5.4	45.9	48.6
		Competent	32	12.5	53.1	34.4
		Expert	32	9.4	53.1	37.5
4.3	Development of partnerships at the international level.	**Entry**	34	11.8	32.4	55.9
		Competent	30	13.3	50.0	36.7
		Expert	30	16.7	63.3	20.0
4.4	Understanding and promoting areas of safety, health and well-being of employees in the workplace.	**Entry**	34	29.4	44.1	26.5
		Competent	33	33.3	36.4	30.3
		Expert	31	25.8	45.2	29.0
4.5	Knowledge of the practical principles of food safety.	**Entry**	36	19.4	50.0	30.6
		Competent	34	26.5	47.1	26.5
		Expert	31	22.6	45.2	32.3
4.6	Knowledge of the practical principles of healthy eating.	**Entry**	33	33.3	27.3	39.4
		Competent	30	36.7	33.3	30.0
		Expert	30	30.0	40.0	30.0
4.7	Knowledge of diseases that can be prevented by vaccines, and encouraging vaccination.	**Entry**	34	32.4	29.4	38.2
		Competent	31	51.6	22.6	25.8
		Expert	31	45.2	38.7	16.1
4.8	Identifying and describing the environmental factors that affect public health.	**Entry**	35	17.1	54.3	28.6
		Competent	36	25.0	63.9	11.1
		Expert	32	21.9	59.4	18.8
	One Health & Health Security percent averages	**Entry**		20.9	39.6	39.6
		Competent		27.8	44.0	28.2
		Expert		23.7	49.8	26.5

[1]Number of responses varied across skill items and described Eco-FPHW workforce levels.

Appendix Table 4.1: Reported *One Health & Health Security* Skills Deficiencies, by Organizations

#	Listed skill/ability	Organizations	⇧ More workforce needed (%[1]) ☐ Entry ■ Competent ■ Expert
4.1	Understanding the significance of the One Health approach and its impact on the health status of the population.	Hospitals	33 67 83
		HMOs	20 20 20
		Health Departments	33 46 54
		Government	27 25 46
		Research Institutes	67 67 67
		NGOs	17 40
4.2	Knowledge of International Health Regulations (IHR).	Hospitals	57 67 50
		HMOs	20 20 40
		Health Departments	53 67 62
		Government	33 33 27
		Research Institutes	67 83 83
		NGOs	33 80 60
4.3	Development of partnerships at the international level.	Hospitals	40 80
		HMOs	25 25 25
		Health Departments	50 50 62
		Government	18 42 64
		Research Institutes	17 100 83
		NGOs	17 40 80
4.4	Understanding and promoting areas of safety, health and well-being of employees in the workplace.	Hospitals	33 40 60
		HMOs	40 20 40
		Health Departments	56 39 46
		Government	42 25 36
		Research Institutes	67 83 83
		NGOs	20 33 20
4.5	Knowledge of the practical principles of food safety.	Hospitals	33 60 60
		HMOs	40 40 40
		Health Departments	71 53 39
		Government	42 33 36
		Research Institutes	67 83 67
		NGOs	17 20 20
4.6	Knowledge of the practical principles of healthy eating.	Hospitals	20 40 40
		HMOs	25 25 40
		Health Departments	40 50 54
		Government	18 8 9
		Research Institutes	33 33 50
		NGOs	33 20 20
4.7	Knowledge of diseases that can be prevented by vaccines, and encouraging vaccination.	Hospitals	20 20 60
		HMOs	20 20 40
		Health Departments	33 25 23
		Government	18 8 36
		Research Institutes	67 33 50
		NGOs	33 40
4.8	Identifying and describing the environmental factors that affect public health.	Hospitals	20 33 60
		HMOs	40 40 40
		Health Departments	77 81 64
		Government	36 54 55
		Research Institutes	67 83 83
		NGOs	40 50 60

[1]Percentages out of total responses per Eco-FPHW workforce level classification.

e. Chapter 5: Leadership & Systems Thinking

Appendix Table 5: Overview of Reported *Leadership & Systems Thinking* Skills Availability, by Workforce Level

#	Listed skill/ability	Eco-FPHW workforce level classification	n[1]	✓ Sufficient workforce available	⇧ More workforce needed	✖ This skill is not relevant in the unit
5.1	Encouraging and motivating others to promote a shared vision and/or outline and organizational goals.	**Entry**	32	18.8	37.5	43.8
		Competent	31	19.4	58.1	22.6
		Expert	31	19.4	58.1	22.6
5.2	Ability to serve as a model to emulate, to build trust and to demonstrate sensitivity to the belief system and values of the other.	**Entry**	33	30.3	36.4	33.3
		Competent	32	28.1	53.1	18.8
		Expert	31	25.8	54.8	19.4
5.3	Leading interdisciplinary teams in public health, including external stakeholders.	**Entry**	35	25.7	20.0	54.3
		Competent	35	22.9	54.3	22.9
		Expert	32	18.8	71.9	9.4
5.4	Promoting change (behavioral and/or cultural) in the organization, in communities and/or in individuals.	**Entry**	34	20.6	50.0	29.4
		Competent	33	24.2	51.5	24.2
		Expert	32	15.6	65.6	18.8
	Leadership & Systems Thinking percent averages	**Entry**		23.9	35.8	40.3
		Competent		23.7	54.2	22.2
		Expert		19.9	62.7	17.5

[1]Number of responses varied across skill items and described Eco-FPHW workforce levels.

Appendix Table 5.1: Reported *Leadership & Systems Thinking* Skills Deficiencies, by Organizations

Listed skill/ability	Organizations	⇧

#			More workforce needed (%[1]) ☐ Entry ■ Competent ■ Expert
5.1	Encouraging and motivating others to promote a shared vision and/or outline and organizational goals.	Hospitals	75 50
		HMOs	20 40 40
		Health Departments	53 69 62
		Government	20 55 70
		Research Institutes	33 83 67
		NGOs	25 50 60
5.2	Ability to serve as a model to emulate, to build trust and to demonstrate sensitivity to the belief system and values of the other.	Hospitals	20 67 80
		HMOs	20 40 40
		Health Departments	57 77 54
		Government	18 39 46
		Research Institutes	50 83 83
		NGOs	20 40
5.3	Leading interdisciplinary teams in public health, including external stakeholders.	Hospitals	50 60
		HMOs	20 60 60
		Health Departments	31 75 79
		Government	39 64
		Research Institutes	17 67 83
		NGOs	20 80
5.4	Promoting change (behavioral and/or cultural) in the organization, in communities and/or in individuals.	Hospitals	20 40 80
		HMOs	40 40 40
		Health Departments	69 69 64
		Government	36 33 64
		Research Institutes	67 83 100
		NGOs	40 50 80

[1]Percentages out of total responses per Eco-FPHW workforce level classification.

f. Chapter 6: Collaboration & Partnerships

Appendix Table 6: Overview of Reported *Collaboration & Partnerships* Skills Availability, by Workforce Level

#	Listed skill/ability	Eco-FPHW workforce level classification	n[1]	✓ Sufficient workforce available	⇧ More workforce needed	✖ This skill is not relevant in the unit
6.1	Maintaining working relationships with stakeholders in interdisciplinary and cross-sectorial projects to improve health services and achieve public health goals.	**Entry**	35	20.0	37.1	42.9
		Competent	33	27.3	57.6	15.2
		Expert	31	22.6	61.3	16.1
6.2	Maintaining working relationships with other departments in the Ministry of Health / Hospitals/ HMOs and with other agencies, such as local authorities, the Standards Institute, the Central Bureau of Statistics, other government ministries, the third sector and relevant Knesset committees and more.	**Entry**	36	33.3	30.6	36.1
		Competent	34	35.3	52.9	11.8
		Expert	32	31.3	53.1	15.6
6.3	Promoting projects and addressing barriers that may limit collaboration.	**Entry**	37	18.9	48.6	32.4
		Competent	35	17.1	74.3	8.6
		Expert	32	12.5	71.9	15.6
	Collaboration & Partnerships percent averages	**Entry**		24.1	38.9	37.0
		Competent		26.5	61.8	11.8
		Expert		22.1	62.1	15.8

[1]Number of responses varied across skill items and described Eco-FPHW workforce levels.

Appendix Table 6.1: Reported *Collaboration & Partnerships* Skills Deficiencies, by Organizations

#	Listed skill/ability	Organizations	⇧ More workforce needed (%[1]) ☐ Entry ■ Competent ■ Expert
6.1	Maintaining working relationships with stakeholders in interdisciplinary and cross-sectorial projects to improve health services and achieve public health goals.	Hospitals	33 / 43 / 67
		HMOs	40 / 20 / 20
		Health Depts.	53 / 77 / 67
		Government	10 / 50 / 60
		Research	20 / 60 / 80
		NGOs	20 / 50 / 75
6.2	Maintaining working relationships with other departments in the Ministry of Health / Hospitals/ HMOs and with other agencies, such as local authorities, the Standards Institute, the Central Bureau of Statistics, other government ministries, the third sector and relevant Knesset committees and more.	Hospitals	29 / 33 / 50
		HMOs	20 / 20 / 20
		Health Depts.	41 / 54 / 46
		Government	9 / 36 / 40
		Research	40 / 80 / 80
		NGOs	25 / 40 / 100
6.3	Promoting projects and addressing barriers that may limit collaboration.	Hospitals	43 / 83 / 83
		HMOs	20 / 25 / 40
		Health Depts.	61 / 80 / 69
		Government	27 / 73 / 60
		Research	60 / 100 / 100
		NGOs	50 / 60 / 100

[1]Percentages out of total responses per Eco-FPHW workforce level classification.

g. Chapter 7: Communication, Culture & Advocacy

Appendix Table 7: Overview of Reported *Communication, Culture & Advocacy* Skills Availability, by Workforce Level

#	Listed skill/ability	Eco-FPHW workforce level classification	n[1]	✓ Sufficient workforce available	⇧ More workforce needed	✖ This skill is not relevant in the unit
7.1	Ability to communicate with speakers and media people, identify target audiences, and develop messages.	**Entry**	33	24.2	39.4	36.4
		Competent	34	26.5	47.1	26.5
		Expert	32	31.3	50.0	18.8
7.2	Promoting health messages through media and social marketing to different audiences, and adapting the messages so that they are culturally appropriate.	**Entry**	34	11.8	50.0	38.2
		Competent	34	26.5	44.1	29.4
		Expert	32	15.6	62.5	21.9
7.3	Ability to be interviewed in the media.	**Entry**	34	14.7	35.3	50.0
		Competent	36	30.6	47.2	22.2
		Expert	32	28.1	65.6	6.3
	Communication, Culture & Advocacy percent averages	**Entry**		16.8	41.6	41.6
		Competent		27.9	46.2	26.0
		Expert		25.0	59.4	15.7

[1]Number of responses varied across skill items and described Eco-FPHW workforce levels.

Appendix Table 7.1: Reported *Communication, Culture & Advocacy* Skills Deficiencies, by Organizations

#	Listed skill/ability	Organizations	⇧ More workforce needed (%[1]) ☐ Entry ■ Competent ■ Expert
7.1	Ability to communicate with speakers and media people, identify target audiences, and develop messages.	Hospitals	60 60
		HMOs	20 20 40
		Health Departments	53 57 71
		Government	36 33 27
		Research Institutes	33 67 33
		NGOs	20 50 40
7.2	Promoting health messages through media and social marketing to different audiences, and adapting the messages so that they are culturally appropriate.	Hospitals	33 60 80
		HMOs	20 20 60
		Health Departments	63 43 64
		Government	33 25 27
		Research Institutes	50 67 50
		NGOs	40 50 80
7.3	Ability to be interviewed in the media.	Hospitals	33 40
		HMOs	20 40
		Health Departments	56 69 79
		Government	9 46 55
		Research Institutes	17 50 67
		NGOs	20 17 80

[1]Percentages out of total responses per Eco-FPHW workforce level classification.

h. Chapter 8: Governance & Resource Management

Appendix Table 8: Overview of Reported *Governance & Resource Management* Skills Availability, by Workforce Level

#	Listed skill/ability	Eco-FPHW workforce level classification	n[1]	✓ Sufficient workforce available	⇧ More workforce needed	✖ This skill is not relevant in the unit
8.1	Managing employees efficiently, providing clear instructions regarding task responsibilities, ensuring training, adequate resources, and providing regular performance feedback.	**Entry**	33	33.3	36.4	30.3
		Competent	35	48.6	42.9	8.6
		Expert	31	29.0	58.1	12.9
8.2	Effective planning of the assignment of work tasks, in order to achieve the goals set by the organization.	**Entry**	36	33.3	33.3	33.3
		Competent	34	41.2	47.1	11.8
		Expert	31	29.0	61.3	9.7
8.3	Detailing job descriptions to promote staff absorption, conducting interviews and evaluating candidates.	**Entry**	32	31.3	40.6	28.1
		Competent	33	39.4	36.4	24.2
		Expert	31	19.4	54.8	25.8
8.4	Knowledge of the principles of economic thinking in public health.	**Entry**	34	14.7	44.1	41.2
		Competent	32	37.5	50.0	12.5
		Expert	31	29.0	54.8	16.1
8.5	Ability to apply economic principles in public health.	**Entry**	34	11.8	41.2	47.1
		Competent	32	21.9	53.1	25.0
		Expert	31	16.1	64.5	19.4
	Governance & Resource Management percent averages	**Entry**		24.9	39.0	36.1
		Competent		38.0	45.8	16.3
		Expert		24.5	58.7	16.8

[1]Number of responses varied across skill items and described Eco-FPHW workforce levels.

Appendix Table 8.1: Reported *Governance & Resource Management* Skills Deficiencies, by Organizations

#	Listed skill/ability	Organizations	⇧ More workforce needed (%[1]) ☐ Entry ▒ Competent ■ Expert
8.1	Managing employees efficiently, providing clear instructions regarding task responsibilities, ensuring training, adequate resources, and providing regular performance feedback.	Hospitals	40 80
		HMOs	40 40 40
		Health Departments	53 53 69
		Government	18 25 46
		Research Institutes	33 50 83
		NGOs	60
8.2	Effective planning of the assignment of work tasks, in order to achieve the goals set by the organization.	Hospitals	17 80 80
		HMOs	20 40 40
		Health Departments	50 43 69
		Government	25 50 46
		Research Institutes	17 67 83
		NGOs	17 40
8.3	Detailing job descriptions to promote staff absorption, conducting interviews and evaluating candidates.	Hospitals	20 20 40
		HMOs	20 20 40
		Health Departments	50 54 69
		Government	18 17 36
		Research Institutes	33 50 67
		NGOs	20 17 40
8.4	Knowledge of the principles of economic thinking in public health.	Hospitals	40 40 60
		HMOs	25 25 25
		Health Departments	56 50 57
		Government	27 33 36
		Research Institutes	83 67 67
		NGOs	33 40 60
8.5	Ability to apply economic principles in public health.	Hospitals	20 20 60
		HMOs	50 50 50
		Health Departments	50 57 71
		Government	18 33 36
		Research Institutes	50 50 67
		NGOs	17 40 60

[1]Percentages out of total responses per Eco-FPHW workforce level classification.

i. Chapter 9: Professional Development & Reflective Ethical Practice

Appendix Table 9: Overview of Reported *Professional Development & Reflective Ethical Practice* Skills Availability, by Workforce Level

#	Listed skill/ability	Eco-FPHW workforce level classification	n[1]	✓ Sufficient workforce available	⇧ More workforce needed	✖ This skill is not relevant in the unit
9.1	Knowledge of the ethical codes relevant to their work.	**Entry**	35	54.3	31.4	14.3
		Competent	31	61.3	29.0	9.7
		Expert	30	60.0	26.7	13.3
9.2	Ability to initiate activities for the professional development and advancement of the employees in the organization.	**Entry**	35	31.4	45.7	22.9
		Competent	35	42.9	48.6	8.6
		Expert	31	38.7	48.4	12.9
	Professional Development & Reflective Ethical Practice percent averages	**Entry**		42.9	38.6	18.6
		Competent		51.5	39.4	9.1
		Expert		49.2	37.7	13.1

[1]Number of responses varied across skill items and described Eco-FPHW workforce levels.

Appendix Table 9.1: Reported *Professional Development & Reflective Ethical Practice* Skills Deficiencies, by Organizations

#	Listed skill/ability	Organizations	⇧ More workforce needed (%[1]) ☐ Entry ■ Competent ■ Expert
9.1	Knowledge of the ethical codes relevant to their work.	Hospitals	20, 50, 50
		HMOs	20, 20, 40
		Health Depts.	41, 31, 23
		Government	27, 18, 10
		Research	67, 50, 33
		NGOs	20
9.2	Ability to initiate activities for the professional development and advancement of the employees in the organization.	Hospitals	20, 60, 60
		HMOs	40, 40, 60
		Health Depts.	65, 67, 54
		Government	27, 33, 27
		Research	50, 67, 50
		NGOs	20, 33

[1]Percentages out of total responses per Eco-FPHW workforce level classification.

j. Chapter 10: Organisational Literacy & Adaptability

Appendix Table 10: Overview of Reported *Organisational Literacy & Adaptability* Skills Availability, by Workforce Level

#	Listed skill/ability	Eco-FPHW workforce level classification	n[1]	✓ Sufficient workforce available	⇧ More workforce needed	✖ This skill is not relevant in the unit
10.1	Ability to initiate and discover innovation, with unconventional solutions as well as thinking outside the box.	**Entry**	37	27.0	48.6	24.3
		Competent	34	41.2	55.9	2.9
		Expert	31	32.3	58.1	9.7
10.2	Ability to deal with uncertainty and manage work-related stressful situations.	**Entry**	36	33.3	47.2	19.4
		Competent	34	41.2	50.0	8.8
		Expert	32	31.3	56.3	12.5
10.3	Ability to manage time well - allocating time frames for the fulfilment of tasks, and the ability to work with deadlines.	**Entry**	36	38.9	47.2	13.9
		Competent	34	44.1	50.0	5.9
		Expert	32	31.3	56.3	12.5
10.4	Awareness and knowledge in submitting an application for available funding\ sources, development and submission of applications and grants for projects and calls for projects.	**Entry**	36	8.3	30.6	61.1
		Competent	34	14.7	64.7	20.6
		Expert	32	18.8	65.6	15.6
	Organisational Literacy & Adaptability percent averages	**Entry**		26.9	43.4	29.6
		Competent		35.3	55.2	9.6
		Expert		28.4	59.1	12.6

[1]Number of responses varied across skill items and described Eco-FPHW workforce levels.

Appendix Table 10.1: Reported *Organisational Literacy & Adaptability* Skills Deficiencies, by Organizations

#	Listed skill/ability	Organizations	⇧ More workforce needed (%[1]) ☐ Entry ■ Competent ■ Expert
10.1	Ability to initiate and discover innovation, with unconventional solutions as well as thinking outside the box.	Hospitals	20 / 60 / 20
		HMOs	40 / 40 / 60
		Health Departments	63 / 57 / 62
		Government	27 / 58 / 46
		Research Institutes	50 / 67 / 67
		NGOs	17 / 20
10.2	Ability to deal with uncertainty and manage work-related stressful situations.	Hospitals	40 / 60 / 60
		HMOs	40 / 40 / 60
		Health Departments	50 / 50 / 57
		Government	46 / 58 / 64
		Research Institutes	50 / 50 / 67
		NGOs	17 / 20
10.3	Ability to manage time well - allocating time frames for the fulfilment of tasks, and the ability to work with deadlines.	Hospitals	40 / 60 / 60
		HMOs	20 / 40 / 60
		Health Departments	67 / 50 / 50
		Government	18 / 50 / 46
		Research Institutes	50 / 50 / 67
		NGOs	17 / 20
10.4	Awareness and knowledge in submitting an application for available funding\ sources, development and submission of applications and grants for projects and calls for projects.	Hospitals	20 / 40 / 60
		HMOs	20 / 40 / 60
		Health Departments	39 / 71 / 64
		Government	18 / 58 / 55
		Research Institutes	33 / 83 / 50
		NGOs	20 / 83 / 60

[1]Percentages out of total responses per Eco-FPHW workforce level classification.