National Public Health Institutes: Contributing to the Public Good

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ABSTRACT

Donor and government funding for public health programs in low-resource countries – to increase immunizations or treat HIV/AIDS, for example – has risen dramatically. Rising less rapidly is the funding for public health functions that are not direct services or linked to programs for high-priority diseases and conditions. In many countries, these functions are housed in National Public Health Institutes (NPHIs). NPHIs are science-based agencies, usually within national governments, that include in their missions such public goods as assessing and monitoring the population's health and responding to outbreaks. Through a survey, we collected information from and about members of a new international organization for NPHIs. The responses illustrate the roles of NPHIs as purveyors of public goods. Data collected in the future on NPHI structures, practices, and challenges will be helpful to countries that are creating or restructuring NPHIs. The new knowledge will also help advocates for increasing budgetary support for the public goods functions of NPHIs.

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INTRODUCTION

National Public Health Institutes (NPHIs) are science-based agencies, usually within national governments, whose missions include

such public goods as assessing and monitoring the population's health and responding to outbreaks. This paper describes the importance of NPHIs in the context of growing concern about and investment in global public health and includes the results of a systematic effort to capture data about the range of NPHI infrastructure and activities.

BACKGROUND

Importance of Strong National Public Health Infrastructure

Every nation faces challenges from preventable causes of death, illness, injury, and disability. In addition to addressing these challenges, national public health infrastructures are expected to participate in multinational efforts to protect against risk factors and diseases that are shared among nations or across borders. Experience with severe acute respiratory syndrome (SARS); fear of pandemic influenza; recent multination distribution of contaminated food, medications, and consumer products; and other events have highlighted the need for national public health infrastructures to be strong and to share information and resources.

In recent years, the importance of public health infrastructure to economic development and to the security of nations has become increasingly clear (1,2), which has contributed to inspiring new investments in public health and its infrastructure. For example, in the 1960s and 1970s, the World Bank supported activities related to only a limited number of health issues, such as family planning, nutrition, and onchocerciasis (river blindness) prevention. By fiscal year 2004, the World Bank was supporting 11 global health partnerships, having lent nearly $20 billion and disbursed $15 billion during 1990–2004 (1,3). Other major new efforts to enhance global health include the work of the Bill and Melinda Gates Foundation, with annual donations of over $1 billion; the Global Fund to Fight AIDS, Tuberculosis, and Malaria; the Bush Administration's President's Emergency Plan for HIV/AIDS Relief; and the International Finance Facility for Immunization, which includes donations from the United Kingdom, France, Italy, and Spain (4). Much of this funding has been used to ensure that people who are at risk for health problems or are ill receive services to prevent or

control specific conditions like malaria or tuberculosis. The funding often benefits specific, identifiable individuals while also having profound effects on public health. Resources have also been invested in studying how to provide services such as these in effective and efficient ways (5,6).

Public Health Functions that are Public Goods

Public goods are functions that are both non-exclusive (people cannot be prevented from benefiting from them) and non-rival (the cost of an additional person benefiting is essentially zero) (7,8). These functions include many of the efforts described above, such as immunization programs to prevent childhood illnesses, as well as functions that have benefited less from focused donor investment but that are nonetheless critical to national public health, such as identifying outbreaks and threats to health and responding or preparing to respond to actual or potential threats. They also include functions that serve as the scaffolding for national public health efforts, such as public health policymaking and coordinating with other countries to develop complementary public health strategies and programs. Because it is often difficult to measure the impact of these functions on specific, identifiable individuals, it can be difficult to know how to distribute the costs of these services and to quantify their value.

The World Health Organization (WHO) has articulated its core functions in its Eleventh General Programme of Work for 2006–2015 (9). These include such public goods as providing leadership, shaping the research agenda, and setting norms and standards. The report notes the difficulties in financing this work, when the majority of WHO funds derive from voluntary contributions, most of which are earmarked for specific projects or programs. Similarly, national governments face challenges in financing public health functions that are public goods.

Role of NPHIs

Within many national governments, NPHIs have public goods functions as their primary focus. As a center of public health leadership and coordination in a country, typical NPHI functions

include such public goods as developing science-based policies, monitoring and responding to changing patterns and determinants of health and disease, and (in countries with low resources) coordinating the use of donor funds to meet national public health priorities (10). They are often critical to countries' efforts to address major public health challenges both within and beyond their borders. They work in partnership with other national agencies, sub-national levels of government, academic institutions, and non-profit organizations; and they coordinate with other NPHIs and multilateral organizations to address global or regional threats.

While some NPHIs, such as those in Brazil and Finland, have existed for decades, others have been created in response to recent public health challenges that highlighted limitations in capacity, leadership, and coordination. For example, in 2004, the Public Health Agency of Canada (PHAC) was created following a series of reports critical of the country's response to the 2002–2003 outbreak of SARS (11). Administrative functions related to setting standards and regulation remained with Health Canada, whereas evaluation and response to both infectious and non-infectious problems were consolidated into PHAC. Other NPHIs formed within the relatively recent past include the China CDC, the United Kingdom Health Protection Agency, and the Hong Kong Centre for Health Protection. Other countries, such as Malawi and Guinea Bissau, are actively working to create NPHIs in the next few years.

Although some NPHIs, like the United States Centers for Disease Control and Prevention and the United Kingdom Health Protection Agency, are well-known, little has been done to characterize the community and range of NPHIs or develop consistent language about NPHIs. The creation of a membership organization for NPHIs – the International Association of National Public Health Institutes (IANPHI) – has provided an opportunity to begin to understand the roles of NPHIs and their contributions to public health functions that are public goods.

International Association of National Public Health Institutes

IANPHI was founded to increase global public health capacity by developing and strengthening NPHIs and creating linkages among them (12). Chartered in 2006, it now has 49 member institutes.

IANPHI supports the development and strengthening of NPHIs by providing technical assistance and funds to countries that do not currently have NPHIs or that have NPHIs with limited capacity, as well as by fostering linkages and support among member NPHIs.

In 2007, IANPHI published a Framework for the creation and development of NPHIs, which is available on its website (www.ianphi.org). This document was developed by a working group comprised of members of the IANPHI Secretariat and representatives from four NPHIs (from Brazil, the Czech Republic, Finland, and the Netherlands) and the WHO. It received extensive review by and input from IANPHI members from around the world.

The Framework describes the Core Attributes, such as facilities and human and financial resources, and the Core Functions (Table 1) that help define NPHIs. It was structured to be consistent with the Essential Public Health Functions (EPHFs) (13,14), which have been in use for over a decade. The EPHFs are a commonly used tool for describing the functions that the public health infrastructure in a

Table 1: Number and percentage of respondents reporting substantial activities, by Core Function (CF)

CF	*Issues covered by CF*	*Number (%) reporting substantial activities*
CF 1	Evaluation and analysis of health status	26 (87)
CF 2	Surveillance, problem investigation, and control of risks and threats to public health	29 (97)
CF 3	Health promotion and prevention programs	25 (83)
CF 4	Social participation and citizen empowerment	21 (70)
CF 5	Planning and management	24 (80)
CF 6	Regulation and enforcement	18 (60)
CF 7	Evaluation and promotion of coverage and access to health services	14 (47)
CF 8	Human resource development and training	21 (70)
CF 9	Quality assurance in personal and population-based health services	17 (57)
CF 10	Public health research	27 (90)
CF 11	Reduction of the impact of disasters on health	21 (70)

country, including its NPHI, must address to fulfill its public health responsibilities. Like the EPHFs, many of the NPHI Core Functions (e.g., evaluating the population's health status and conducting surveillance) are public goods. The Framework has provided a shared language and construct for discussing, assessing, and supporting the development of NPHIs.

The need for better data about how to describe, organize, and evaluate the role of government in supplying public health-related public goods has been described before (15). However, few systematic efforts have been made to understand how central governments organize public health functions, especially in developing countries. An exception is an evaluation conducted under the auspices of the World Bank about the impact of management reforms on public health practice (16). This study, which focused largely on public health goods, provided many findings relevant to NPHIs, including:

- Promoting competition among agencies responsible for public health functions does not improve efficiency; rather, it impedes collaboration.
- Contracting does not work well for public health functions where measurement is complex.
- Decentralizing public health functions without some central oversight is a risky strategy, since local governments have little incentive to invest in functions that are public goods.

THE 2007 IANPHI SURVEY

To address the lack of data on NPHIs, to increase understanding about the community of NPHIs, and to support the efforts of countries to create and enhance them, IANPHI surveyed its members on their current infrastructure and capacities. The results highlight the diversity of NPHIs, as well as opportunities to build on existing infrastructure and activities of NPHIs to improve public health.

Methods

The survey had two parts: one on infrastructure and one based on the NPHI Core Functions (Table 1). The Core Functions were used as an organizational basis because they had been widely discussed

among IANPHI members during the development of the NPHI Framework and were being used by some NPHIs to describe their activities on a routine basis. The survey form can be accessed at www.ianphi.org.

The survey included several questions on each of the Core Functions. For example, the most complex of the Core Functions, Core Function 2, had four subparts, each of which had several associated questions (13 questions on surveillance, nine on epidemiologic investigations, five on laboratory capacity, and three on outbreak response). Where possible, the questions were derived from the large number of instruments that have been developed for assessment of EPHFs, such as those used by the Pan-American Health Organization (14).

For each question about each Core Function, respondents were asked to rate their level of activity as: "none or minimal," "some," "a lot," or "comprehensive." For each Core Function or subpart of a Core Function, examples were provided to guide NPHIs in determining which response best characterized their level of activity. In general, the examples of comprehensive activities had characteristics of being multifaceted and systematic and having nationwide reach or impact. For purposes of analysis, the categories of "none or minimal" and "some" were combined into a category designated as "limited," and the categories of "a lot" or "comprehensive" were combined into a category designated as "substantial."

IANPHI Member and Survey Respondent Characteristics

Thirty of the 47 IANPHI members at the time of the survey provided data, for a response rate of 64%. Survey respondents and nonrespondents are listed in Table 2. Responses were received from countries from all World Bank economic rankings and all WHO regions (Tables 3 and 4). However, consistent with the distribution of IANPHI membership, respondents tended to be from high-income countries and from the European region.

Respondents most commonly reported being part of the Ministry of Health (43%) or being an autonomous government agency (37%). One respondent is part of another Ministry (Ministry of Social Affairs). The remaining five reported a variety of governmental, quasi-governmental, or other arrangements.

Table 2: Listing of respondents and non-respondents to the 2007 IANPHI survey

Respondents

Country	*Institute*
Belgium	Scientific Institute of Public Health
Brazil	Fundação Oswaldo Cruz (Fiocruz)
Cuba	Instituto de Medicina Tropical "Pedro Kouri"
Czech Republic	National Institute of Public Health (SZU)
Denmark	National Institute of Public Health
Estonia	National Institute for Health Development
Finland	National Public Health Institute (KTL)
Hong Kong	Centre for Health Protection
Iceland	Public Health Institute of Iceland
Indonesia	Indonesia National Public Health Institute
Iran	Institute of Public Health Research
Japan	National Institute of Public Health
Mexico	Instituto Nacional de Salud Pública
Morocco	Institut Pasteur du Maroc
Netherlands	National Institute for Public Health and the Environment (RIVM)
Nigeria	Nigerian Institute of Medical Research
Norway	Norwegian Institute of Public Health
Pakistan	Institute of Public Health
Panama	Instituto Commemorativo Gorgas de Estudios de la Salud
Portugal	Instituto de Higiene e Medicina Tropical
Russian Federation	National Research Center for Preventive Medicine
Slovenia	Institute of Public Health of the Republic of Slovenia
South Africa	National Institute for Communicable Diseases
Spain	Instituto de Salud Carlos III
Sweden	Swedish National Institute of Public Health
Tanzania	National Institute for Medical Research
Thailand	National Institute of Health of Thailand
United Kingdom	Health Protection Agency
United States	Centers for Disease Control and Prevention
Vietnam	National Institute of Hygiene and Epidemiology

Non-Respondents

IANPHI member countries that did not respond to the survey are: Argentina, Bangladesh, Canada, Chile, China, Colombia, Croatia, France, Germany, Hungary, Ireland, Italy, Kenya, Mozambique, Serbia, and Turkey.

Table 3: Characteristics of responding and non-responding IANPHI members, by World Bank economic ranking

Economic ranking	*Respondents (%)*	*Non-respondents (%)*	*Total (% of total members)*
Low income	4 (13)	4 (24)	8 (17)
Lower-middle income	5 (17)	2 (12)	7 (15)
Upper-middle income	4 (13)	6 (35)	10 (21)
High income	17 (57)	5 (29)	22 (47)
Total	30	17	47

Table 4: Characteristics of responding and non-responding IANPHI members, by WHO region

WHO Region	*Respondents (%)*	*Non-respondents (%)*	*Total (% of total members)*
Africa	3 (10)	3 (18)	6 (13)
Americas	5 (17)	4 (24)	9 (19)
Eastern Mediterranean	3 (10)	0 (0)	3 (6)
Europe	14 (47)	8 (47)	22 (47)
Southeast Asia	2 (7)	1 (6)	3 (6)
Western Pacific	3 (10)	1 (6)	4 (9)
Total	30	17	47

Resources

Twenty-eight respondents reported budget or full-time-equivalent staff (FTE) data. Numbers of FTEs ranged from 23 to 15,000 (Table 5). Budgets ranged from $32,920 to $8.5 billion – differing by a factor of nearly 260,000. The median budget for respondents from lower-income countries was $4.2 million, and the median budget for respondents from high-income countries was $43.8 million, an order of magnitude difference. Respondents from high-income countries

Table 5: Respondent budgets, FTEs, and populations (Only respondents that provided budget data are included).

Characteristic	*Low income*	*Lower-middle income*	*Upper-middle income*	*High income*	*Overall*
Provided data	4	4	3	17	28
FTEs: range	63–576	110–400	205–4,457	23–15,000	23–15,000
FTEs: median	320	176	307	600	369
Budgets: range	$32,920–$13,000,000	$1,300,000–$5,000,000	$4,000,000–$22,296,239	$4,900,000–$8,500,000,000	$32,920–8,500,000,000
Budgets: median	$4,170,000	$1,500,000	$11,744,622	$43,800,698	$15,908,926
Country populations (thousands): range	39,459–159,002	30,497–223,042	3,284–104,221	299–298,988	299–298,988
Budget-to-thousand population ratio: range	Approx 0–$155	$19–$49	$214–$1,218	$171–$30,292	Approx 0–$30,292
Budget-to-thousand population ratio: median	$152	$22.5	$248	$9,274	$2,137

and countries with larger populations tended to have bigger budgets. Overall, reporting respondents had a median budget of $2.14 per person living in the country (based on population numbers from the World Bank (17)).

All 25 respondents that reported on the sources of their funds received some national government funding, and all but two supplemented this with other sources of funds. For six of these, national government sources accounted for less than half of their budgets.

Core Functions Overview

Table 1 provides data on the number of respondents reporting substantial activities in at least one aspect of each of the Core Functions. Over half of the respondents have substantial activity in some aspect of each of the Core Functions except for CF 7, *evaluation and promotion of coverage and access to health services*. Respondents were most likely to have substantial capacity in the Core Functions related to evaluation and analysis of health status (CF 1); surveillance, problem investigation, and control of risks and threats to public health (CF 2); and public health research (CF 10), and least likely to have substantial capacity in the Core Functions related to health care (CF 7 and CF 9) and regulation (CF 6).

Four respondents reported substantial capacity in at least one aspect of all 11 Core Functions, and 20 respondents (67%) reported substantial capacity in eight or more Core Functions. The respondents that focused on only a limited number of Core Functions were in countries representing all economic strata.

Diversity Among Respondents

Responses to questions about the many specific aspects of some of the Core Functions were consolidated to create Table 1. However, this obscures important differences. Within each Core Function, the scope and kinds of activities undertaken by respondents vary greatly, and these differences are not explainable by geographic region or economic ranking. This is particularly apparent from an examination of the responses related to CFs 2, 3, and 10, which

included questions related to both infectious and non-communicable conditions.

CF 2: Surveillance, problem investigation, and control of risks and threats to public health. The section of the survey on CF 2 included questions on (a) surveillance, (b) epidemiology, (c) laboratory capacity, and (d) assistance during outbreaks. All but one respondent (97%) reported substantial amounts of activity in at least one of the four aspects of CF 2. Sixty-seven percent reported substantial amounts of activity in all four aspects.

Eighty-seven percent of respondents conduct substantial amounts of surveillance for at least one condition. Two of the four respondents that reported that they do not conduct substantial amounts of surveillance of any kind are in high-income countries.

Information about numbers of respondents conducting surveillance for specific conditions is included in Table 6. Although 16

Table 6: Number and percentage of respondents conducting substantial surveillance and epidemiologic investigations, by condition addressed

Condition	*Number (%) with substantial activities in surveillance*	*Number (%) with substantial activities in epidemiologic investigations*
Any infectious disease	22 (73)	24 (80)
HIV/AIDS	21 (70)	Not asked
Malaria	15 (50)	Not asked
Tuberculosis	16 (53)	Not asked
Immunizations	16 (53)	17 (57)
Any non-communicable condition	16 (53)	18 (60)
Nutritional status	12 (40)	9 (30)
Tobacco use	11 (37)	8 (27)
Chronic diseases	11 (37)	11 (37)
Maternal and child health	10 (33)	10 (33)
Injuries	7 (23)	8 (27)
Mental health	5 (17)	6 (20)
Occupational health	2 (7)	6 (20)

respondents (53%) report conducting surveillance for at least one non-communicable condition, only one conducts surveillance for all of the conditions queried. Non-communicable condition surveillance is most often conducted for nutritional status, tobacco use, and chronic diseases but the percentage conducting surveillance for each of these was less than 50%. Surveillance for injuries and for occupational health is even less common. Twelve of the 16 respondents conducting surveillance for non-communicable conditions are in Europe.

Eighty-seven percent of respondents conduct substantial numbers of epidemiologic investigations for at least one condition. More respondents conduct substantial epidemiologic work for infectious disease-related issues (80%) than for non-communicable conditions (60%). Three of the four that have limited capacity to conduct epidemiologic investigations are in high-income countries. Information about numbers of respondents conducting epidemiologic work for specific conditions is included in Table 6.

CF 3: Prevention programs and health promotion. Twenty-five respondents (83%) conduct substantial health promotion and prevention programs. Almost the same number conduct health promotion and prevention programs for infectious as for non-communicable conditions (Table 7); however, seven conduct programs only for infectious disease-related issues and six conduct programs only for non-communicable conditions. Four of the six respondents with only non-communicable condition programs are in Europe. Those conducting only infectious disease programs are from many regions. Only one respondent reported substantial programs in all of the categories queried.

CF10: Public health research. Almost all respondents (90%) conduct substantial research related to at least one of the conditions identified in the survey (see Table 7 for a listing of conditions addressed in the survey and the number and percentage of respondents reporting substantial activities in each). Equal percentages (77%) conduct research on infectious disease-related and non-communicable conditions. Four (one from a lower-income and three from lower- or upper-middle income countries) conduct substantial amounts of research for infectious disease-related conditions but not non-communicable conditions. Four respondents, three of which are from high-income countries, conduct substantial amounts of

Table 7: Number and percentage of respondents with substantial health promotion and prevention programs, and with substantial public health research activities, by condition addressed

Condition addressed	*Number (%) conducting health promotion and prevention programs*	*Number (%) conducting research*
Any infectious disease	19 (63)	23 (77)
Immunizations	15 (50)	16 (53)
Any non-communicable condition	18 (60)	23 (77)
Nutritional status	11 (37)	14 (47)
Tobacco use	10 (33)	12 (40)
Chronic diseases	10 (33)	16 (53)
Maternal and child health	11 (37)	15 (50)
Injuries	5 (17)	8 (27)
Mental health	3 (10)	8 (27)
Occupational health	5 (17)	7 (23)

non-communicable condition research but not research on infectious disease-related issues.

Only three respondents conduct substantial amounts of research related to all of the conditions listed in the survey. These are from three different economic rankings. Many respondents from high-income countries conduct research on only a limited number of conditions, and two do not have any substantial research activities.

Work in Health Care and Human Resource Development

Respondents from many countries provide services that are important for the work in other sectors, such as health care and education. The two Core Functions that relate to health care are *CF 7 (Evaluation and promotion of equitable access to health services) and CF 9 (Quality assurance in personal and population-based health services)*. Seventy-three percent of respondents have substantial activities in either CF 7 or CF 9, the healthcare-related Core

Functions, with 47% reporting substantial activities related to CF 7 and 57% reporting activities related to CF 9. Typical roles for NPHIs in healthcare services include evaluating access to health services; providing specific kinds of services, like immunizations; conducting surveillance or investigation for problems related to health services; and providing laboratory confirmation or reference services.

CF 8 addresses *human resource development and training*. Seventy percent of respondents have substantial activities in human resource development and training. Eighteen (60%) have substantial activities related to evaluating the capacity of or filling the gaps in the country's public health workforce, and 18 (14 of those that have substantial activities related to the country's public health workforce) have substantial efforts to train their own staff. Twelve respondents (40%) offer training leading to masters or doctoral degrees.

Discussion of the Survey Data

Although the Framework provides a way of organizing thinking about NPHIs, it does not provide an explicit definition or criteria for what constitutes an NPHI. This makes it impossible to compile a comprehensive listing of NPHIs; consequently, the question of the representativeness of our data for the world's NPHIs cannot be answered. Nevertheless, the surveyed agencies come from throughout the world and from different economic strata. Given the diversity of responding NPHIs, it is likely that this survey depicts the range of infrastructures and capacities worldwide. IANHPI is continuing to work to expand and diversify its membership. Future surveys will likely capture data on a larger proportion of the world's NPHIs.

These survey data illustrate that IANPHI members provide critical public health functions. While some of the reported activities, such as surveillance for HIV/AIDS, may be in support of disease-specific initiatives, others provide broad benefits that cannot be linked to any particular condition or disease.

The budget information indicates that while many NPHIs are well-funded, many have only limited resources to carry out their work. Although detailed comparisons of budgets should be conducted with caution because of the diversity of NPHI responsibilities, the range of budgets – from tens of thousands to billions of

dollars – is striking. Among survey respondents, a median of only $2.14 per person is available for the services that NPHIs provide. This likely includes funds that support programs to provide high-priority disease-specific services, for example, related to HIV/AIDS. Thus, the amount available for public health functions that are public goods but are not linked to these programs, like population health assessment, may be much more limited.

Most IANPHI members work on a number of Core Functions, with those that relate to population health assessment, protection (surveillance and response), and research being the most commonly reported. Within the Core Functions that can be divided by type of health problem they focus on, more survey respondents work on infectious diseases than on non-communicable conditions, especially outside of Europe. In some cases, agencies other than the IANPHI member may be working on non-communicable conditions. However, in many cases these data likely reflect national lack of capacity. For example, in 2004, only 75 countries reported reliable annual data on road traffic injuries, even though these are a leading cause of death and disability, responsible worldwide for an estimated 1.2 million deaths and 50 million injuries each year (18).

The data raise questions about the organization and structure of national public health and NPHIs that cannot be resolved without further probing. A better understanding of different models for organizing such functions as surveillance and response will be helpful to countries that are considering how to structure their NPHIs, particularly if such information can be combined with observations on the resultant abilities of countries to respond to public health crises. Other issues include the advantages and disadvantages of placing the leadership for epidemiologic and laboratory investigation of outbreaks in a single NPHI, having a single agency focus on both infectious and non-communicable conditions, and maintaining routine or reference laboratory services in the NPHI. Based on the experience in Canada and other countries, one could hypothesize that a strong, consolidated NPHI has the potential for more effective and efficient performance of such functions.

We envision this snapshot of NPHIs as an early step in the development of a long-term strategy to draw attention to and increase support for the public goods that provide the underpinnings for national public health infrastructure. This strategy will include

broad-brush evaluations like the IANPHI survey, as well as detailed focus on specific NPHIs, for example, the key-informant interviews we conducted to describe how NPHIs develop (summaries of experiences in Canada, Morocco, South Africa, and the United States are available at www.ianphi.org). Besides being useful for countries that are seeking to build or restructure NPHIs, further data could potentially help existing NPHIs – including those that are well-funded – make difficult decisions about structure, as well as provide a basis for requesting donor funds to help countries with fewer resources to create structures that are likely to be effective in fulfilling NPHI roles. Given that data are an important part of advocacy, and advocacy can result in dramatic increase in global expenditures to fight specific diseases or health problems in developing countries (3), building the knowledge base about NPHIs and public health functions may help garner support.

CONCLUSION

Emerging infectious diseases, recognition of the toll of non-communicable conditions, and concerns about health-related losses in security and productivity will continue to result in pressure on national governments to modify and improve their national public health infrastructures. This will include calls to enhance such public goods functions as surveillance and the development of national policies and regulations that affect not only individual country populations, but also the health of the world. Much of the responsibility for answering these calls will fall to NPHIs. Without increased advocacy, however, funds for NPHIs, especially in low-resource countries, are unlikely to increase in line with the need. Data about NPHI organization and functioning, and a more thorough understanding of how nations organize and fund public health functions that are public goods but are not part of high-priority programs, will be an important contribution to advocacy efforts and to public health.

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