

Multisectoral Preventive Health Services in Sri Lanka

Lessons for Developing Countries
in Providing Public Goods in Health

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Abstract

What can other developing countries learn from Sri Lanka on achieving good health at low cost? While its well-organized medical and maternal-child health services have been documented elsewhere, this paper fills a gap in documenting how it organizes services to reduce the population's exposure to disease—a pure public good. The key factors underlying the effectiveness of these services are (1) strong focal points in the central Health Ministry for supporting preventive services; (2) pro-active outreach by the health line agency to collaborate with

other sectors/ agents whose work influences public health outcomes; and (3) community-level delivery institutions with well-trained multivalent Public Health Inspectors—all underpinned by (4) assured tax-based financing. This paper describes this system in some detail such that other countries can learn from Sri Lanka's successful approach to improving population health. It also makes some recommendations for strengthening the system in response to changing conditions.

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Introduction

The need for health system strengthening is widely recognized.² The high-profile pandemics of zoonotic diseases such as SARS and avian flu have also raised interest in multi-sectoral approaches to improving health outcomes.³ Yet, as Mills et al. (2006:100) point out, little is known about what types of institutional arrangements and delivery strategies help achieve widespread health improvements.

Key to this are services that reduce exposure to disease – a pure public good which in developed countries form a core part of publicly-provided health services.⁴ Intensive efforts to strengthen these services contributed to rapid improvements in health outcomes from the late nineteenth century,⁵ and continuing attention to these services protects against the resurgence of these diseases. For example, malaria was eradicated in the Southern United States by the 1940s, but the health authorities continue to monitor environmental management and vector breeding, to prevent resurgence.⁶ Given many developing countries' continuing burden of communicable disease – as well as the growing burden of non-communicable diseases – developing countries need to prioritize strengthening these services. Yet these issues receive limited attention in discussions of developing country health systems.⁷

Sri Lanka is known for its “good health at low cost”. Many factors contribute to this, but a well-organized health sector is a central component. In 2010, it had similar health expenditure per capita⁸ as other lower-middle income countries, but achieved a life expectancy at birth of 75 years, compared with 65 years for the category average.⁹ Medical facilities are available within 5-10 km of most rural habitations (Hsiao 2000), and preventive health services also cover the whole population, as discussed here.

Preventive health services are known in Sri Lanka as public health services, and are organized separately from the medical services. Here they will be called public health services.

The organization and delivery of Sri Lanka's public health services offers many useful lessons for other developing countries. They cost around 0.2% of GDP in 2008,¹⁰ and contribute to the country's high levels of health equity and very low mortality for its GDP per capita.¹¹ Some components of these public health services have been analyzed, such as its Maternal and Child Health services (WHO 2007b) and the potential for managing Non-Communicable Diseases (Engelgau et al 2010). Its medical services and health financing have also been analyzed (Hsiao 2000, Rannan-Eliya 2001, 2008).

This paper fills a gap by documenting the organization of Sri Lanka's services to reduce the population's exposure to disease. These services are delivered at community level by a national cadre of Public Health Inspectors, who carry out a very wide range of tasks. Their work is multi-sectoral in nature – involving interaction and collaboration with several other public sector agencies, the private sector, and Local Authorities – and close collaboration with communities. They are supported by strong national stewardship and grassroots delivery institutions.

Section 1 describes the organization of public health services in Sri Lanka, and its key institutional strengths. These include (1) central financing; (2) central policy-making, technical standardization, staff training and recruitment; (3) strong focal points in the Health Ministry for supporting public health service delivery; and (4) proactive multisectoral collaboration to assure public health. Section 2 describes the grassroots delivery institutions, the roles of the Public Health Inspectors, and the collaboration with Local Authorities (local governments) in assuring public health and sanitation. Section 3 discusses some institutional impediments to better service delivery, and possible ways of addressing them. The last section concludes.

1. The organization of public (preventive) health services in the central Health Ministry

The overall organization of Sri Lanka's public health services at central level and below is described briefly here, summarizing the key institutional strengths of the system.

The Health Ministry is headed by a Minister and a Secretary, who are the only political appointees in the Ministry, the rest being technical staff from the line agency. The Secretary may be from the Sri Lanka Administrative Service (SLAS) or a medical officer from the Ministry — offering a career path to the top for people from either a public health or medical service background. The Director-General of Health Services (DGHS) is in charge of the Ministry's technical work, managing the Deputy Directors-General (DDGs) in charge of Medical Services, Public Health Services, Laboratory Services, and various ancillary services¹². The DGHS, DDGs, and Directors in the medical, public health and laboratory service branches are usually medical officers who have risen through the ranks, with firsthand experience of the functioning of the services on the ground.¹³

Public health services are supported by seventeen Directorates each of which is the national focal point for its area, responsible for reviewing the policies, system strategies, training curricula, program implementation mechanisms and other organizational and managerial inputs in view of emerging issues and challenges. They make recommendations to the DDGs and DGHS and thereby to the Health Secretary and the Minister. If the suggestion for change arises at a higher level, the relevant DDGs and Directors are always consulted. This helps to ensure that the planning process is well-informed by technical people.

The Health Ministry provides overall direction and monitoring of public health services throughout the country, and supports service delivery down to the grassroots. At the Province and Regional (district) levels, line agency staff manages program implementation under the administrative control of the Provincial governments.¹⁴ The lowest level is the MOH unit, headed by the Medical Officer of Health (MOH). The MOH team includes nurses and midwives who provide Maternal and Child Health services, and Public Health Inspectors (PHIs) who provide environmental health and disease control services.¹⁵

The medical services are administered separately, and comprise tertiary hospitals, specialized hospitals, and various levels of secondary hospitals down to the divisional level. Below these are the Primary Care Centres which provide only out-patient services. However, the public health and medical services collaborate continuously for disease surveillance, case referral, and many other purposes described below.

1.1 Central financing¹⁶

The central government finances all public health services, from the center to the grassroots, and these services accounted for only 5.2% of total health spending in 2008 (De Alwis, Fernando, and Rannan-Eliya 2011).¹⁷ It also finances nearly half the total spending for medical services, with the rest coming from private sources, mostly for out-of-pocket expenses.

The central financing is provided both directly and through grants to the Provincial governments.¹⁸ The bulk of the funds is used for recurring expenses such as salaries, or is earmarked for specific purposes, such as maternal and child health (MCH) work, and cannot be used for other purposes without the Treasury's permission.

Local revenue collection is low. The Provincial Councils derive nearly 90% of their total revenues from the central government¹⁹, and in turn pass on some funds to Local Authorities. Even in the large Local

Authorities such as the Municipal Councils (which have higher locally-generated revenues) — including the largest municipalities — 65% of the salaries of permanent staff are estimated to derive from Provincial Council funds.²⁰ Local Authorities pay for discharging their own responsibilities for maintaining hygienic conditions in their area. Smaller Local Authorities have limited funds to spend on these services: solid waste management alone used up 81% of the health outlay of one Local Authority in 2008.

All public sector health staff salaries are paid directly by the Provincial Health Ministries, except for PHIs hired by the LAs, whose salaries are paid by the LAs (using funds supplied by the Provincial Councils). This applies also in the four large Municipal Councils. Most variable costs for public health services are also paid for by the Provincial Department of Health. This includes the costs of the MOH units and their staff, including the costs of continuing education, uniforms, motorbikes, equipment and supplies such as registers – and the cost of line agency support to Local Authorities in carrying out their environmental sanitation responsibilities (Appendix 1). There may at times be delays in flow of funds from the center to the provinces.

The great strength of this system is that it assures that subnational levels have the funds for public health services. This contrasts with the heavy dependence of public health service provision on provincial and local revenues in China, and on state revenues in India. However, these funds might be more effectively used if the Sri Lankan Health Ministry had greater inputs into how the Treasury and Finance Commission allocates the health funds to the provinces (Section 3.1).

1.2 Centralized policy-making, technical standardization, staff training and recruitment

Policy planning and many key aspects of assuring quality service delivery are highly centralized. The Health Ministry is responsible for formulating health policies, guidelines, setting standards, enacting legislation, setting uniform training standards for health staff, and ensuring availability of health staff across the country. Through its directorates, it provides technical guidance, training, and support to the provincial health authorities. This applies to the whole publicly-funded health system, including all preventive, curative and other ancillary services such as laboratory, rehabilitative, education, training and research services.

The Health Ministry develops standardized curricula for basic training and in-service training for each of the line agency posts, and pays for the training. It advertises and fills all the line agency positions in the provinces, with the concurrence of the province. The basic training courses are a pre-requisite for being hired by the line agency. In the case of Public Health Inspectors (PHIs), it is a pre-requisite also if they are hired by Local Authorities — ensuring that PHIs throughout the country belong to a standardized cadre and are able to collaborate easily with each other and with the line agency as required.

The center remains in regular dialogue with the provincial health authorities through the Health Development Committee (HDC). This meets once in two months under the chairmanship of the DGHS, and includes the central Directors as well as the Provincial and Regional Directors of Health, and Directors of tertiary hospitals.

1.3 Strong focal points in the Health Ministry for supporting public health service delivery

The Health Ministry has several Directorates in charge of public health services. Of these three are key because they address a broad range of services: Maternal and Child Health, Epidemiology, and Environmental and Occupational Health (E&OH). The Directorate for Health Education supports all the other Directorates. There are several other public health Directorates, which vary greatly in staffing and facilities, as well as in the extent of reporting they receive on the programs they oversee. Some are for

disease-specific control programs — Malaria, Filaria, Tuberculosis and other respiratory diseases, Leprosy, STD/AIDS, and Rabies.²¹

The three key Directorates are described in some detail below. The Directorate of E&OH is described in the most detail, as it has the broadest responsibility for population-based disease prevention and control services.

The Directorate of Environmental and Occupational Health (E&OH) is housed, like most Directorates, within the Health Ministry building and has one or two rooms and some support staff. However, the Directorates for Epidemiology and for Maternal and Child Health have received much donor attention in recent years,²² and have expanded into large separate modern multi-storey office buildings, well-equipped and with much support infrastructure and staff so that they are well-placed to support and monitor service delivery. They nevertheless remain officially on par with the other Directorates.

The Directorate of Maternal and Child Health, now called the Family Health Bureau (FHB) is responsible for maternal and child health services. It provides national guidelines for MCH issues, and supports and monitors the provision of antenatal care, postnatal care, well-baby care, immunizing pregnant women and children, and family planning.

Data from the MOH units on MCH work done by its staff is aggregated at the district level and sent via the provincial level to the Directorate for analysis, and as input to the FHB's annual report. This reporting greatly helps in program monitoring, and in providing feedback to the periphery through regular meetings at the district level to improve service provision. Specific lapses can be traced to the MOH unit by the district staff, and raised at the RDHS' monthly meetings which all MOHs attend. However, this depends on the follow-through of the provincial health staff. The maternal death audits conducted by the FHB keep peripheral workers vigilant about maintaining service quality.

The FHB is able to do all this because it has a large technical and support staff — now around 20 Medical Officers and some additional consultant physicians, along with public health nursing sisters, an accountant, administrative officer and other support staff including for data management. These also enable the FHB to handle its own programmatic, financial, administrative, and establishment issues with some autonomy.

The Directorate of Epidemiology (now called the Epidemiology Unit) has diverse functions related to disease control, which provide essential support for the other public health Directorates. These include communicable disease surveillance (Box 1 describes the mechanisms)²³; data collection and analysis; publishing the surveillance data on a weekly basis; preparing the list of notifiable diseases; investigation and technical inputs in prevention and control of disease outbreaks; monitoring hospital cross-infections between patients; and conducting in-service training programs on epidemiological surveillance (disease surveillance), investigations on disease outbreaks and immunization.

Its functions also include activities to support the immunization program, including preparing national immunization schedules; identifying target populations for vaccination; and procuring, storing, distributing, and maintaining the cold chain for vaccines. Implementing immunization is done under the MCH program and school health program.

When a disease outbreak occurs, the Medical Officer of Health (MOH) in charge of the area notifies the Epidemiology unit, which provides technical guidance and support to the MOH in detection, investigation and control of the outbreak. With the help of the Public Health Inspectors (PHIs), the MOH collects information on the occurrence of notifiable diseases in his/her area and follows it on a spot map, to help analyze and control the situation better. The MOH is responsible for continuing to report the disease

incidence to the Epidemiology Unit, so that it can monitor the progress of the outbreak until it is controlled. When a situation is critical the Epidemiology unit may send teams to investigate to ascertain the aetiology of the disease. The Director (E&OH) will be involved if there are issues with regard to food safety or other issues related to environmental sanitation.

The Epidemiology unit alerts the MOHs and their staff to upcoming seasonal diseases. For example before and during the rainy season they send circulars to be vigilant about possible outbreaks of dengue and recommend preventive measures to undertake. This circular is copied to the relevant directorates including Director (E&OH) and provincial directors.

Like the FHB, the Epidemiology Unit is able to carry out this wide range of activities because its staffing was greatly increased and it is well-equipped with needed infrastructure in a large modern building. They also have Regional Epidemiologists in place at district level, to help support the Directorate as well as the MOH units.

The Directorate for Environmental and Occupational Health (E&OH) handles a large portfolio, including environmental health, occupational health, and food control administration. Its duties require far more focus on intersectoral coordination than the other Directorates, as well as drafting complex public health legislation such as the Mosquito Act (Appendix 2), and developing training curricula for staff working on the wide range of tasks encompassed in this Directorate's portfolio. However, this Directorate operates out of limited office space, and with a skeletal staff except for food safety.

The PHIs are under the purview of this Directorate. The Principal PHI (PPHI) assists the Director with regard to various aspects of the PHI's work, including review of policy, program development, addressing environmental sanitation issues, trade union issues, conducting review meetings, job functions and responsibilities of PHIs, and their capacity building. Supervision of PHIs is done at the MOH level by the MOH and the Supervising Public Health Inspector (SPHI), at RDHS level by the SPHID, and at the PDHS level by the Provincial PHI, and by the PPHI from the central level.

However, the Directorate has no organized information system on the functioning of the services under its purview, for lack of staff and facilities. They cannot systematically monitor the PHIs' work, as the data generated through their Monthly Reports are not collated at the center. All PHIs, including those hired by Local Authorities,²⁴ submit Monthly Reports to the MOH. The information is available only at the MOH offices. When there is a need, the center has to request the RDHS or MOH individually for the data. There is a real need to provide the resources to establish a well-developed information system like that of the Epidemiological Unit and the Family Health Bureau.

Data for policy formulation and program development are gathered in ad hoc ways, such as occasional surveys, carrying out situational analysis and needs assessments, or by sending out questionnaires for specific purposes. The Epidemiology Unit is an important source of information on food- and water-borne diseases. Their data on food poisoning and other notifiable gastro-intestinal diseases is used by the Dir (E&OH) to understand and improve hygienic practices in food handling establishments and in the community, and assess water quality monitoring. Data collected by the Epidemiology Unit as well as by the disease-specific programs also provide information on other diseases associated with poor environmental health conditions.

The Directorate has two sections (1) the Environmental Cell, which is responsible for the environmental and occupational health program, and (2) the Food Control Administration Unit which is responsible for the food safety and hygiene program.

- The Environmental Cell is severely understaffed, despite the wide range of activities it is expected to cover. The Ministry of Environment has loaned the Cell one Environmental Management Officer with a degree in Environmental Science. In addition one or two medical officers work on a temporary basis on rotation for short periods.

Urbanization and industrialization have increased the environmental health challenges facing MOHs and PHIs, and they needed additional training to address these challenges. The Director (E&OH) in consultation with several experts developed a curriculum for a certificate course in environmental health.

With donor help, services have been strengthened in indoor air pollution and healthcare waste management (HCWM). The latter involved work on policy and planning, and on training programs. HCWM treatment facilities were installed for the Colombo Group of Hospitals, which account for half the health care waste in the country. Regulatory mechanisms for enforcement and monitoring of HCWM have been developed along with the Central Environmental Authority.

- The Food Control Administration Unit (FCAU) is responsible for the implementation of the food safety program, and develops standards and guidelines under the Food Act. Better staffed than the Environmental Unit, it has two assistant directors who are senior Food and Drugs Inspectors (F&DI), supported by fifteen F&DI. The CODEX/SPS enquiry point under the food safety program is directly under the Director (E&OH) and has three officers who have graduated in Food Science.

The FCAU works with PHIs in various ways, for the enforcement of the Food Act and its regulations. It offers an advanced 3-month training course to build Public Health Inspectors' (PHIs) capacity to handle more complex issues. This certification is required for applying for the post of F&DI, offering career growth for PHIs. It also conducts regular in-service training on food safety and hygiene for PHIs (5-day training) and MOHs (3-day training). It also assists the PHIs if a case they have filed becomes complicated, for example by obtaining legal assistance from the Attorney General.

In comparison with the E&OH program, the food safety program has better coordination and communication between the center and periphery because of the presence of F&DI at the majority of RDHS offices (Govt of Sri Lanka 2007: Table 21). The Directorate has a well-developed system for assuring food safety, including inspection and regulation of the food processing industry (for both food exports and for domestic consumption), using a combination of having independent certification agencies ascertain that the producers meet specified standards, and checks by the Food Inspectors. Food vendors are checked by the PHIs and sometimes also by the F&DIs. The food safety system will be detailed elsewhere.²⁵

The Directorate has clear guidelines for inspecting meat safety by checking animals before slaughter, and by inspecting slaughterhouse and meat vendor hygiene before these are licensed. The Colombo Municipal Council has its own Veterinary Department for such inspections. The PHIs assist the local authority in checking meat safety in Pradeshiya Sabhas and in urban Local Authorities without a veterinary department. However, there are considerable gaps in the implementation of these measures, arising from shortfalls in local government interest and inadequate supervision of PHIs (section 3.3).

The Health Education Bureau (Directorate of Health Education) plays an important role in supporting the work of all the public health Directorates. It is the focal point at national level responsible for health promotion, preparation of IEC materials, mass media communication and advocacy. It also provides the technical know-how to all Health Ministry Directorates and other institutions for preparing health education materials and to identify communication strategies in promoting and strengthening the relevant

programs. This covers all kinds of health education, ranging across the spectrum of communicable and non-communicable diseases.

The Directorates for controlling specific communicable diseases provide technical guidance, supplies, oversight, and monitoring of the programs for malaria, filaria, TB and other respiratory diseases, leprosy, STD/AIDS, and rabies. On the ground, these campaigns are managed by the Medical Officers of Health and their staff, and by Public Health Inspectors. For a few disease-specific programs, PHIs are specially trained and assigned to work in them. In the Anti-Leprosy Campaign the Public Health Inspectors are fully in charge, responsible for the management of all active cases and providing drugs to them, as well as conducting educational programs and other preventive activities in the field.

Given the high level of reporting required by donors for these disease-specific programs, records of activities are maintained and regularly transmitted to the heads of the special programs through the district and provincial level administration. There is good coordination between these programs and the district-level staff.

It is not necessarily optimal to have these separate programs. For example, the Directorates for Malaria and Filaria are assisted by provincial Entomological Assistants, who conduct entomological surveillance, monitor breeding sites, collect data for the mosquito-biting index, and undertake some control activities such as introducing larvivorous fish in breeding sites. The Ministry is now considering using them also for dengue, but it would be simpler to have a vector-borne disease control program, with a single reporting system and staff. It would also be more efficient not to have separate laboratories for different disease-specific programs, such as malaria.

1.4 Multisectoral collaboration for assuring public health

The Directorate of Environmental and Occupational Health (E&OH) has established some good inter-sectoral collaboration mechanisms. For example, it works with the Agriculture Ministry to test pesticide residues in selected vegetables. It collaborates with the Chambers of Commerce to dialog with food producers and food processors on the formulation and enforcement of food safety regulations. It works with independent certification agencies for assuring the safety of processed food and bottled water.

It collaborates at various levels with the Department of Animal Production and Health (DAPH) of the Livestock Ministry, to ensure food safety and protect against outbreaks of zoonotic diseases. To screen imported food for safety, the Directorate posts Food and Drug Inspectors in the Customs Department to inspect food before it is cleared by Customs. For imported meat, poultry and frozen fish, these F&DI conduct inspections jointly with the animal quarantine division of the DAPH, to ensure food safety and animal health safety respectively. This helps prevent the import of zoonotic diseases.

For information on zoonotic disease threats within the country or from trans-border migration, a collaborative mechanism is in place with the DAPH, whereby the DAPH alerts them if there is a problem that might affect human health. The DAPH has a veterinary surveillance system, which monitors animal and bird populations, including livestock, poultry, and wild birds. Wild animals that may pose a threat are monitored, such as monkeys for rabies. The veterinary surveillance system has been expanded since 2006, and district Veterinary Investigation Centres (equipped with laboratory diagnostic facilities) operate directly under the DAPH.²⁶ These district VICs have already been established in the majority of districts. They conduct veterinary surveillance, laboratory analysis and disease investigation services, and also support the divisional veterinary offices in the district. They pass information about potential zoonotic diseases on to the provincial health staff, as well as to the central Health Ministry's Epidemiological Unit.

The Directorate also collaborates with other agencies such as the National Water Supply and Drainage Board. There is a Collaborative Council on water and sanitation, which includes government and non-government agencies working in this sector.

The Directorate also has good inter-sectoral collaboration with several other Ministries. It collaborates with the Central Environmental Authority, of the Environment Ministry. The Committee on Environmental Policy and Management (a committee of the Environment Ministry), has a standing committee co-chaired by the Health Secretary and the Environment Secretary, to facilitate collaboration on health issues. Given the multiplicity of environmental health issues that need to be jointly addressed with Local Authorities, the Directorate also collaborates with the Department of Local Government, and the Director is a member of various committees of the Ministry of Provincial Councils and Local Government. They collaborate on issues such as solid waste management in local authority jurisdictions.

Occupational health services have been neglected and need strengthening in training, service provision, and monitoring and enforcement mechanisms. The Directorate has collaborated on this with the Labor Ministry, which is responsible for the enforcement of the Factories Ordinance. In collaboration with the Faculty of Medicine, Colombo, the Directorate conducts a 5-day in-service training program in occupational health for PHIs and MOHs. It has also formed an interagency committee co-chaired by the Secretaries of Health and Labor; and prepared a national action plan based on a needs assessment.

With the rise in non-communicable diseases, recent efforts have been made for preventing and managing these diseases. Sometimes they are placed outside the direct purview of the Health Ministry. For example, following the Act passed in 2006 for controlling alcohol and tobacco, a National Tobacco and Alcohol Authority was established to oversee this. However, this Authority lacks ground-level reach. The Health Ministry was pro-active in collaborating with this Authority to set up District Tobacco Control Cells headed by the district health officer (RDHS)²⁷, with representatives from the police, excise officials, and others involved in implementing the Act. They have defined the tasks of these Cells, which include (1) active health education for behavioral change, efforts to prevent children from beginning to smoke, helping those who want to stop smoking, supporting civil society efforts to reduce smoking; (2) enforce bans on promoting tobacco products; and (3) monitor tobacco use, and enforce fines, prosecutions, and arrests if needed. PHIS are involved in these activities

2. Community-level service delivery

2.1 The Medical Officer of Health (MOH) units

The public health services are delivered through about 300 Health Units, headed by Medical Officers of Health (MOH). The government norm is for each MOH unit to cover a population of 80,000 to 100,000. Four of these are managed by Municipal Councils (Colombo, Kandy, Galle, and Jaffna) which have much larger populations and well-staffed public health units.

Each MOH heads a multidisciplinary public health team. The team is subdivided into a female team responsible for maternal and child health and family planning, and a male team of Public Health Inspectors (PHIs) responsible for disease prevention and control activities, including food safety. The composition of the team varies. The MCH staff typically includes 1-2 Public Health Nursing Sisters (PHNS), 1-3 Supervising Public Health Midwives (SPHM), and a team of Public Health Midwives (PHMs). The PHI team is much smaller, typically 1 Supervising Public Health Inspector (SPHI) and a small team of PHIs. The government norm is for PHIs to cover a population of about 10,000, while PHMs cover about 3,000. The number of PHIs have increased very slowly over time relative to PHMs (Govt of Sri Lanka 2007:Table 20). 11% of the health workforce in 2008 was in the public health

services, of which 61% were PHMs, and 16.5% were PHIs or Food & Drug Inspectors (Engelgau et al 2010: Table 3.3, derived from official statistics).

The MOH supervises the work of both the MCH and the PHI teams. A key component of this supervision is the Monthly meeting of the whole team. This is an occasion for the whole team to interact with each other and discuss problems for which they may be able to find collaborative solutions. The MOH informs them of new initiatives and directives from the central public health Directorates and other parts of the line agency. They are given demonstrations of new techniques, such as a new kind of disposable syringe. They are given talks by a specialist on different issues each month, which serves to update their training. They may meet with others, such as holding a discussion with a doctor from a nearby hospital, where the MCH staff may raise questions about procedures for admitting women for delivery, or PHIs may raise questions about the medical services' speed of response in the event of a disaster or terrorist attack. The PHI and MCH groups will make a presentation on their work, and discuss how they can collaborate to solve a particular problem. PHIs may decide to team up with PHIs from a neighboring area to conduct a food raid, or address other common public health threats. In sum, the monthly meeting is an exceptional opportunity for teamwork and updated training.

The MOHs are responsible for data reporting up the line agency. They send the weekly epidemiological surveillance data collected by the PHIs to the Epidemiology Unit (Box 1), and the reporting on MCH activities to the Family Health Bureau. They have the PHIs' monthly reports aggregated and sent to the RDHS. They attend coordinating meetings held by the RDHS, where the RDHS staff and staff from the centre attend. At these meetings, program implementation is reviewed and new initiatives discussed, and strategies discussed for improving implementation and addressing obstacles to or shortfalls in implementation. It is mandatory to audit all maternal deaths, and this is then subject to a thorough investigation at MOH level.

The MOHs have many responsibilities on MCH work, which is given much priority given the scrutiny from above. They hold antenatal care clinics, assisted by one or more of the MCH staff, referring more difficult cases to the nearest hospital with an OB-GYN specialist. They hold well-baby clinics, immunizing the children, monitoring their growth, and writing prescriptions for medicine that parents can collect from the nearest hospital/dispensary. They also hold family planning clinics, e.g. inserting IUDs though sterilization is carried out by the medical services. Sometimes all these MCH clinics are combined in a polyclinic.

The MOHs support the PHIs' work in various ways, though they may overlook some issues that are not monitored from above (section 2.2.1). They are assiduous in having PHIs collect and validate information on cases of communicable disease, and send the data reports upwards. They are also responsible for organizing the management of any disease outbreak or disaster. They supervise the PHIs' role in tracking cases of communicable disease, and monitoring compliance with treatment for specific diseases such as TB. If a PHI has grounds for prosecuting a case under the Mosquito Act, he needs the MOH's sanction. For prosecuting cases under the Food Act, the PHI can proceed on his own. However, under the Nuisances Act, the PHI must recommend prosecution through the MOH to the chairman of the local authority for sanction. The MOHs interact with the Local Authorities on monitoring and supporting a wide range of public health tasks (Appendices 1 and 2), and managing outbreaks and disasters.

2.2 The Public Health Inspectors (PHIs): A nationally-standardized cadre working with communities to reduce exposure to disease

Sri Lanka's PHIs carry out a very wide range of tasks to reduce exposure to disease. Their work is multi-sectoral in nature — involving interaction and collaboration with a multiplicity of other public sector agencies, the private sector, and Local Authorities — and close collaboration with communities.

PHIs work in many capacities. The majority work as “Range” PHIs, who are the grassroots workers that cover the whole population of the country. They are part of the public health team of either the Department (under an MOH), or of a local government body. They have the widest range of tasks (Box 2), as they are responsible along with their MOH for addressing any kind of public health threat facing the area they serve. They have to work closely with Local Authorities, public and private entities involved in activities that could constitute public health threats (such as drainage, water supply, food supply), regulation of several private sector activities, regulation of homes, unauthorized constructions, etc. This section focuses on the work of Range PHIs, but the other major types of PHIs are described briefly first.

Some PHIs are assigned to work in tertiary hospitals, tasked with overseeing hospital sanitation, and disease notification. Their duties are described in Box 3. They inform the MOH of communicable diseases, for follow-up in the population by the Range PHIs. They inform the Epidemiological Unit directly of specially notifiable diseases such as cholera (Box 1). They oversee the hospital’s cleaning and waste management, identify health hazards, oversee the control of vectors and pests, and assure food safety and water safety — reporting lacunae to the head of the institution, who takes the necessary measures. In disasters and epidemics, they organize measures to prevent the spread of disease. They conduct health education, and maintain records of all their work. In the absence of such measures, hospitals can spread disease internally and also become epicenters of disease outbreaks for the outside world. Non-tertiary hospitals and dispensaries are visited by range PHIs, to check their sanitary conditions and collect disease notification data for follow-up, as described below.

Some PHIs are assigned to work for institutions such as ports, airports, blood transfusion services, the Medical Research Institute, and the Health Education Bureau. Yet others are assigned to specialized disease-control campaigns such as those for controlling leprosy, malaria, filariasis, STD/HIV, and rabies, though all range PHIs address cases of these diseases in the area they serve.

PHIs who take a special 3-month training course can apply when positions open up for Food and Drug Inspectors in the center or under the Regional Directorate of Health services, which offers an opportunity for career advancement. Other opportunities for career advancement include being promoted to Supervising PHI, to serve at Regional PHI, and Provincial PHI. The top position is that of Principal PHI, working in the office of the Director (E&OH) in the central Health Ministry.

The basic requirement for applicants for PHI training is to have passed the high school (GCE “A” level) examination in biological sciences. Earlier, a high school degree was the basic requirement. If admitted for training, they undergo an 18-month training course, with 12 months of classroom-and-practical teaching on a wide range of technical issues on public health, as well as on leadership, law enforcement, and management (Box 4). This is followed by 6 months of field practice with a range PHI.

All PHIs receive the intensive 18-month training, which is centrally standardized and financed. They are then recruited by the central Health Ministry, and assigned to their posts. This assures a nationally-standardized cadre, even when they are hired by Local Authorities, where they are not directly under line agency control. Specialized training for specific tasks and continuous training is also centrally standardized and funded. Range PHIs’ training is continuously upgraded through presentations by technical specialists at monthly meetings, and other short training programs.

2.2.1 “Range” PHIs

Each of these PHIs has their own “range”, a geographic sub-section of the area covered by the MOH unit or the local government. The central government norm specifies that a PHI should cover an average

population of 10,000. They are able to cover this area because they are issued with a motorbike. Also, they are supposed to live within the area they serve, although many live near the area.

Duties

Their duties encompass an impressive set of activities (Box 2), of which some are assuring food safety and water safety, school health, preventing the spread of disease, vector control, rabies control, assisting in epidemiological surveillance, and organizing disease prevention and control in disasters and epidemics. For example, PHIs carried out disease prevention and control activities after the 2004 tsunami (WHO 2005), and in the camps for the internally displaced after the civil war. They provide health education in a variety of formal and informal settings, to alter people's behaviors to help prevent and manage communicable and non-communicable diseases including anti-smoking efforts. They help Local Authorities with their environmental health and sanitation responsibilities (Appendix 1). Each of these tasks involves several activities (Box 2).

When cases of communicable diseases and food poisoning are reported — by hospitals, private doctors, communities, or from applications for medical certificates for sick leave — the PHI investigates the case, and reports whether it is genuine to the MOH. They then trace contacts and take measures to prevent the disease from spreading. They visit non-tertiary hospitals and dispensaries to check their sanitary conditions, and to check that all cases of notifiable diseases have been reported to the MOH.

They keep track of disease outbreaks by using color-coded pins on a wall-map of their “range” in their office. This classic and inexpensive epidemiological tool helps them identify possible factors underlying the outbreak. It also helps them with their task of tracking cases of TB, STDs, and leprosy, and checking that they complete their treatment. If there is a specialized disease control campaign, they help in the effort: for example, by checking their range for possible sources of mosquito breeding and following up to see that the breeding is controlled. They maintain a series of registers and records of the work they do.

Range PHIs play a key role in helping Local Authorities maintain environmental sanitation. This involves a wide range of tasks (Appendix 1), many of which require the sanction of the Local Authority (Appendix 2). These functions could be better reflected in the PHI's Monthly Report register, cutting down on less-needed reporting and encompassing more fully their tasks in assisting Local Authorities.²⁸

Collaboration with communities

Range PHIs are heavily dependent on community collaboration to perform their tasks, as it is not possible for them to be everywhere at the same time. Their training prepares them for this task. They learn how to behave respectfully towards the communities they serve, and elicit their trust and cooperation. This also helps them mobilize communities in health prevention activities, including periodic cleaning of the environment for example to prevent vector breeding. They learn how to identify respected people within communities (such as retirees) who have the time and capacity to work with the PHI. They treat these community volunteers with respect, so high-caliber people volunteer. Such people can assist PHIs in many crucial ways, for example by informing them of an outbreak, and chlorinating wells after a flood at the PHI's request and using supplies provided by him.

Importantly, the PHIs are taught to maintain strict confidentiality so that people with stigmatized diseases such as TB can be comfortable taking their help. When interviewed, PHIs report with pride that they try to avoid attracting attention by marching into TB patients' homes regularly, but instead contact them by cellphone to check that they are taking their medication.

Over the decades, communities have developed expectations of their PHIs. Their status in the community is reinforced by newspaper reports of special activities such as a food raid conducted by PHIs, or an announcement that if they have certain symptoms they should ask their PHI for treatment for leptospirosis. Newspapers also report cases of PHIs neglecting their duties, keeping up public pressure. Thus PHIs must answer not only to their superiors, but to their communities.

Use of prosecution powers

The way the PHI system was designed can be summarized in Roosevelt's phrase "Speak softly and carry a big stick". Their khaki uniforms convey the fact that they have considerable legal authority backing their work. Yet they are trained to work closely with the people they serve, to elicit their trust and compliance through persuasion, rather than resorting to threats. Field observation indicates that they maintain a low-key professional attitude when inspecting a grocery store or advising cooked food vendors on how to improve their hygiene. They place considerable emphasis on advising food vendors on how to improve food safety and hygiene, as the survey below indicates.

PHIs are trained to resort to legal action as a last resort, when their efforts to elicit compliance have failed. Should legal action be required, they are trained to conduct prosecutions on their own, helped by a system that is procedurally transparent and quick. Public health legislation is in place, backed by a court system that functions fairly smoothly to process cases quickly in a magistrate's court. Stakeholders have many channels through which they can learn about the regulations, and how to complain if needed.

Above all, there are clear procedures and independent pre-validation checks that must be met for a prosecution. Simple but clear procedures must be met for taking a food sample, after which it is tested in public health laboratories that function completely independently of the PHIs and local bodies. If the sample is found deficient the case is adjudicated in magistrates' courts which are also independent. The court will reject the case unless all the prescribed procedures have been followed.

Working conditions and supervision

PHIs' working conditions facilitate productivity and effectiveness. They have a clear job description. Their productivity is enhanced by being issued motorbikes and the use of simple tools such as wall charts and maps with color-coded pins as described above. Simple forms such as the rating forms for food safety make it easy for them to guide food vendors on improving hygiene.

They are treated with respect by their superiors, a simple but effective management principle that is not found applied to grassroots health workers in some countries. They participate in local intersectoral coordination committee meetings on environmental health and sanitation issues, and in inter-sectoral investigation teams. Respect is also shown in other ways. For example, when medical students do field projects during their community medicine training, the PHIs guide the medical students in the field under the supervision of an MOH, sharing their knowledge and experience with the medical students.

Their MOH and Supervising PHI (SPHI) supervise and support their work. The SPHI is expected to pay especial attention to supervising the poorer performers. In case of noncompliance or continued poor performance, they are supposed to initiate disciplinary procedures. However, many SPHIs have not been formally promoted to that position, which may somewhat limit their authority.

Survey of PHI performance

To obtain some idea of actual performance on the ground, a survey was conducted in 2008 in four districts. Three were from the Western Province (Colombo, Gampaha, and Kalutara) and one from the

Northwestern province (Kurunegala). This was a convenience sample of districts not too far from the capital city, given the conflict situation then in full spate. 165 PHIs were interviewed, of which 83% worked for the line agency. In a separate survey, interviews were conducted with 172 cooked food vendors who operate within the same range as the PHIs surveyed, of which 31% were restaurants and the remainder smaller outlets such as snack bars and tea/coffee shops. Roughly 60% of the sample was in rural areas and 40% urban.

Of the PHIs surveyed, 93% had motorbikes. They attend their monthly supervisory meetings regularly: on average 11 times during the past year. Their office notice boards were fairly well-maintained, with 91% having their area maps displayed, and 83% their schedule of activities for the month (Advance Program). 75% had updated maps and charts, but while 83% of those in the rural areas had these, only 60% of those in urban areas did. This suggests that the supervision of urban PHIs, where significant numbers are local authority hires, needs special attention.

The PHIs are well-supervised for certain communicable disease control tasks such as surveillance, validation of reported cases, and follow-up of the patient and their contacts and to ensure against spread of disease. Other tasks are less carefully supervised, and the survey results indicate that many of these are neglected. For example, only 64% had done a survey of their area as required when they start service in their range.

Impressively, several of the less supervised tasks are routinely performed. The survey found that PHIs pay considerable attention to several key areas, including food hygiene, school health, and mobilizing communities to protect their own health. This is aside from their routine work with communities and community volunteers to protect their health through reporting cases of illness, testing and chlorinating the water supply, etc., and supporting Local Authorities in their environmental health and sanitation responsibilities.

Of the PHIs, 89% had mobilized one or more community groups in the past year: 86% for dengue control, 62% for cleaning drains, and 73% for various special programs. And 77% had completed surveys of the schools in their area, with the lapses more for the small schools. Of the schools surveyed, all had safe drinking water, 90% had adequate sanitary facilities, and 82% had established school clubs (which the PHIs help establish). Of the schools surveyed, 78% had had a medical inspection of the children, which the PHIs assist the MOH to perform.

The PHIs are also active in assuring the safety of food sold by vendors, which is within their power — unlike inspecting meat safety, which is subject to Local Authorities' powers. For example, 85% of the food vendors reported that they had been inspected prior to registration, though only 41% had received their annual inspection note the previous year. During the preceding year, 80% of the vendors had received guidance from PHIs on improving their hygiene, and 65% of them had received a rating form so they could keep track of changes in their rating. Respondents in rural and urban areas gave broadly similar reports.

The PHIs are active in making food vendors aware of the regulations. 90% were aware of them, and 84% reported that the PHI had told them about the regulations (16% also reported learning of them from the newspapers). The food vendors were also very aware of the powers of the PHI in implementing the regulations: 95% of them knew that PHIs are authorized to conduct inspections, 90% knew that PHIs can file cases if the regulations are not met, and 80% knew that their premises could be sealed. However, the emphasis is more on offering food hygiene guidance than on exercising legal powers: only 40% reported that food samples for testing had been taken from their establishments during the preceding year.

There are major gaps in formal training in food handling. The MOHs are supposed to offer training courses along with the PHIs, but this was not reported by vendors. MOHs also do few medical checkups of food vendors. 87% of establishments reported that no staff had been medically checked, and only 3% reported that all their staff had been checked. Only 15% of vendors reported having been trained by PHIs. Some obtained training privately, but only 13% of establishments had all their staff trained. Moreover, either the quality of training or its retention is poor: of respondents who received training, 10% reported having learnt about the Food Act, 27% about hygiene standards, 32% about personal hygiene, and 27% about safe food handling & storage.

The PHIs reported being motivated primarily by community appreciation (reported by 48%), and the sense of performing a needed public service (39%). This was also evident in interviews where PHIs recalled with pride how hard they worked to help people affected by the tsunami. The demotivating factors reported largely reflected perceived impediments to their work: inadequate fuel allowance (66%), lack of authority to implement regulations (38%), the need to update public health regulations and revise fines rendered meaningless by decades of inflation (36%). 10% of PHIs also reported being frustrated that citizens complain to them about issues that they are not empowered to resolve.

2.3 Collaboration with Local Authorities in assuring Environmental Health and Sanitation

Local Authorities have clear responsibilities for assuring environmental health and sanitation, as detailed in their respective Acts. The provincial authorities provide them with funds to carry out these duties. They also have some sources of own revenue, varying greatly with the nature of the local authority.

There are three kinds of local authority: Municipal Councils, Urban Councils (for larger towns), and Pradeshiya Sabhas (for small towns and rural areas).²⁹ The four large Municipal Councils (Colombo, Galle, Kandy, and Jaffna) have significant revenue sources of their own and have full-fledged public health departments of their own independent of the health line agency — though all their staff receive the centrally-standardized training.³⁰ These Municipal Council health departments cooperate closely with the central Health Ministry as needed. Other Municipal Councils vary considerably in their own revenues, and depend to differing degrees on the MOH units and the health line agency. They may hire some PHIs of their own, and sometimes also an MOH with a full team. Pradeshiya Sabhas have very low revenue bases of their own, and typically rely on the line agency MOH unit.

Most of the country's local bodies depend on line agency MOH units to help them fulfil their environmental health and sanitation duties, which are multisectoral in nature. The multiplicity of ways in which MOHs and PHIs help local bodies are detailed in Appendix 1. Local bodies who can afford to hire some PHIs or an MOH are assigned staff who have been trained and recruited by the Health Ministry, and can collaborate easily with other MOH unit staff and line agency staff.

Detailed legal provisions for protecting public health are contained in various legislations (Appendix 2). Further legal provisions are also contained in the Municipal Council Ordinance, Urban Council Ordinance, Pradeshiya Sabha Act, which have quite similar provisions across the three types of local authority. The laws give extensive powers to the Local Authorities, including making it mandatory for the police to help them enforce their regulations.

All Local Authorities are designated as the general administrative authority for assuring public health conditions within its area. They are responsible for a wide range of functions, such as maintaining clean roads, drainage, solid waste management, latrines, conservancy, and scavenging, insanitary buildings, unauthorized building, public utility services, water supply, markets and food safety. They are responsible for maintaining common amenities within their area, such as public markets, parks, open spaces, gardens, canals, and public buildings. Most broadly defined, they are responsible for addressing

any public health “nuisance” (potential threat). However, the different resource base of the local bodies means that they differ in their ability to address their public health responsibilities. The MOH and PHIs help Local Authorities with most of these tasks, as detailed in Appendix 1.

More recently, some of these functions have been taken over by other government agencies, such as the National Water Supply and Drainage Board, the National Housing Development Authority and the Urban Development Authority, making the Local Authorities dependent on those institutions to serve their administrative areas. The National Water Supply and Drainage Board conducts routine sampling and analysis of the water distribution network through their own monitoring mechanisms. PHIs can take independent water samples for testing, as a cross-check, and if a problem is found he will notify the Regional Engineer to take action.

Beside the Local Authority Acts, there are many other laws that empower Local Authorities to protect public health, such as the Food Act, Nuisances Ordinance (listed in Appendix 2). An important power is the power to demolish unauthorized constructions, which can create health hazards, for example by blocking drainage. However, these powers are not always exercised, partly because of local vested interests.

3. Improving the functioning of the public health system

Sri Lanka’s public health system is well-designed to protect population health at low cost. However, the context in which it was designed was changed, and these changes impede its functioning more effectively. The two major changes are the devolution of powers to the provinces and local bodies, and imbalances in the resourcing of different Directorates in the Health Ministry that hinders the functioning of the Directorate of E&OH. This section discusses some of the major impediments, and possible solutions. Compared with the institutional obstacles facing public health systems in most developing countries, those in Sri Lanka are relatively easy to address.

The system was designed such that the central government had direct administrative control of service delivery on the ground. However, this was altered by the Constitutional Amendment of 1987, which devolved powers to elected bodies in the provinces, including administrative authority over all health department staff in the province. The Health Ministry can no longer directly supervise the ground-level implementation of health policies and programs.

Moreover, most of the legislation supporting environmental health and sanitation empowers Local Authorities to protect health in their areas. This is true even of the Nuisances Act, which provides powers to address a very wide range of potential public health threats. As ESCAP (n.d.) points out, this system was designed at a time when the Local Authorities were directly supervised by the central government. However, when local government became a devolved subject under the Provincial Councils, these supervisory powers were transferred to the Provincial Councils. ESCAP (n.d.) notes that this injected politics into the decision-making process and degraded standards at the local level — and that politics intrude even further when people from a different political party are in power in a local authority.

Elected bodies have many concerns, and their members are not necessarily expert on public health issues. Assuring public health may not be a high priority for them, unless constituents demand these services, or there is an outbreak or other event that attracts public attention. Conflicts of interest arise, for example the desire to collect revenues through issuing licenses without proper public health scrutiny to food vendors or for construction. Other conflicts of interest may arise where public health action threatens the interests of influential people. Health department staff are affected by these concerns insofar as they under the administrative control and payroll of the elected bodies.

That political factors have come to intrude on line agency functioning is has been noted by several agencies. For example, WHO (2007b:20, 43) notes serious issues with provincial level health stewardship, and that supervision need much strengthening.

With its very limited resources, the Directorate of E&OH lacks the resources to monitor service delivery on the ground. This is especially unfortunate since Local Authorities' public health responsibilities relate to environmental health and sanitation issues, and therefore the services under the purview of the Directorate of E&OH are the most affected by the devolution of powers. The under-resourcing of the Directorate of E&OH also threatens the quality of the PHIs work, as the MOH units focus more on delivering the services that are closely monitored by the centre.

3.1 Need for more formal interface between the health line agency and Local Authorities

Funds for public health services are now transferred directly by the Treasury to the provincial and local authorities, who can make budgetary decisions at the margin after covering the recurring costs which use the bulk of the funds. One way of increasing accountability might be to increase the Health Ministry's limited input into how the Treasury allocates its funds for the health sector. Given that the central government is the source of most of the health spending at ground level, some incentives could be devised for service quality. The WHO (2007b: 94) suggests that strengthening the capacity of the Ministry's planning unit (MDPU) might help in this process.

There is an increasing trend of Local Authorities building up their own health staff and decreasing reliance on the health department. They request the central government to allocate PHIs to them directly, so that they are under their administrative control and not that of the health department. These PHIs submit their monthly reports to the MOH, may seek technical support from the health department MOH, and attend the monthly supervisory meetings, but they are answerable to the Local Government. The Local Government pays their salary, though the funds originate largely from the centre. There is also a trend whereby some Urban Councils are upgraded to Municipal Councils, sometimes with the help of higher-level politicians from the area. This empowers them to collect more local revenues, but they have nothing like the technical and financial resources to run a strong health department of their own, like the Colombo Municipal Council.

A Presidential [Commission of Inquiry on Local Government Reforms](#) notes that few Local Authorities comply with circulars from their own central Ministry instructing them to facilitate the work of the health department:

“Although by circular instructions, the Local Governments (Local Authorities) are required to pass a resolution appointing the Medical Officers of Health as Executive Officers of the Local Authority and placing them in charge of activities under Public Health and Sanitation, they do not pass any such resolution generally and in fact what actually happens is that the technical recommendations of the Medical Officer of Health are sometimes unheeded, the Local Authority acting in the manner it thinks best normally having a political flavour.” (Govt of Sri Lanka 1999: Section 8.1.2.1, parentheses ours)

This puts MOHs and their PHIs in a delicate situation. They must keep up good working relations with the Local Authorities, so they cannot be excessively zealous in trying to hold them accountable for their public health responsibilities. Those PHIs and MOHs hired by Local Authorities face an even more complex situation in discharging their duties, as they have to serve under their administrative jurisdiction for life.

There is clearly a need for a more formal interface to be established between the health department and Local Authorities. Mechanisms to enforce the requirement that Local Authorities pass this resolution to put the MOH in charge of public health would help, better still would be passing legislation that does away with this requirement for a resolution and puts the MOH officially in charge in public health activities.

The Health Ministry takes residual responsibility if there is a disease outbreak. The Epidemiological Unit learns of outbreaks through their surveillance system, and will instruct the MOH on the action to be taken. Health Ministry funds are used if needed. The cooperation of the Local Authority will be sought, and they cooperate. This offers some protection *after an outbreak has occurred*, if Local Authorities fail in their environmental health and sanitation responsibilities, whether due to lack of funds or neglect.

However, the Health Ministry could do more to avert outbreaks. For example, they could conduct independent audits of the public health conditions in Local Authorities, and publicize the results to raise citizen demand for better services. They could also require PHIs to report more fully on their work in supporting Local Authorities fulfill their public health responsibilities. The PHI report form used by the Colombo Municipal Council offers a concise form for this.

3.2 Responses to the changes arising from the devolution of powers to elected bodies

The Health Ministry's public health Directorates have taken some important steps to devise alternative mechanisms to provide central stewardship and monitoring of service quality. In these efforts, the MCH and Epidemiological services have made the most progress, because their central units have been greatly strengthened with donor support. The disease-specific programs — also strongly supported by donors — have strong mechanisms for monitoring program implementation and supporting it as needed. However, The Directorate of E&OH has low capacity to support and monitor service delivery, as it is highly under-resourced (section 3.3).

One step is to collect data from the ground level, to monitor service delivery and increase the accountability of provincial, district, and MOH staff. The Family Health Bureau has the capacity to monitor grassroots service delivery and give feedback through meetings held with the RDHS and the MOHs. Their maternal death audits incentivize protection of maternal health to avoid this scrutiny, in particular by MOHs closely supervising Public Health Midwives' (PHM) work. This may also help explain the different trends in hiring of grassroots staff: between 1982 and 2007, the number of PHMs per 1000 population doubled, while that of PHIs rose by 38 percent (Govt of Sri Lanka 2007: Table 20).

The Epidemiological Unit also collects data from various ground-level sources, including weekly epidemiological reports from MOHs (Box 1). The data are analyzed at the centre and feedback sent to the periphery. The Regional Epidemiologist can investigate disease outbreaks. If needed, the Central Epidemiological Unit can also investigate, and special investigations are conducted for several diseases such as cholera (Box 1).

Another step is to place officers in the district (RDHS) office to oversee specific programs. For example, the RDHS office is designed to have a Medical Officer (MCH) supported by a Regional Supervising Public Health Nursing Officer, and a Regional Epidemiologist. Some disease-specific programs are also represented by staff in the RDHS office. However, the Directorate of (E&OH) has no representation for the tasks under its purview (except a Supervising PHI): this post needs strengthening. The food safety program is supposed to be represented by a Food and Drug Inspector in the RDHS office but as of December 2007 many did not have one (Govt of Sri Lanka 2007: Table 21).³¹

The central Department of Animal Production and Health (DAPH) also notes that most of its field-level functions were devolved in 1988 to the provinces, supported by divisional offices.³² The role of the central DAPH was to provide technical expertise and support services to the provincial departments. This may be one reason why they have established district Veterinary Investigation Centres (equipped with laboratory diagnostic facilities) operating directly under the DAPH.³³ These Centres conduct veterinary surveillance, laboratory analysis, and disease investigation services, and also support the divisional veterinary offices in the district.

3.3 Severe under-resourcing of the Directorate of Environmental and Occupational Health

The Directorate (E&OH) does not have the staff and facilities to analyze the data from the PHIs' Monthly Reports on their work, and therefore is not in a position to provide feedback on this. This lack of measurement reduces the incentives for MOHs to scrutinize much of the work that PHIs do, as well as the PHIs' work incentives. It would greatly help to strengthen the Directorate's resources to monitor field activities at the centre, and have Medical Officers (E&OH) in the RDHS office (helped by the Regional Supervising PHI) to provide regular technical support and supervision to lower levels, and coordinate with the centre.

The Director tries to compensate for the shortfalls in monitoring and feedback by personally interacting with peripheral staff during district-based review programs conducted periodically by the RDHSs, where the Director (E&OH) is invited to participate on EH and food safety activities. This gives peripheral staff an opportunity to interact directly with the central officer, provide feedback on issues they face and receive direct guidance on technical and administrative issues. Similarly, quarterly reviews for district-level SPHI(D)s and F&DI are held in the centre. The Director also chairs the board that selects PHIs and F&DIs to be sent on fellowships abroad, to ensure that the candidates are selected on merit alone. Such efforts help fill some of the gaps in the system and motivate field staff, but are no substitute for formal monitoring and feedback on service delivery.

The Directorate (E&OH)'s food safety program has better coordination between the center and regional levels, since its Food Control unit (FCAU) is much better-staffed at the center. The FCAU conducts quarterly review meetings for F&DI and SPHI (D) at national level. The presence of F&DIs in many RDHS offices strengthens program review and support, but some lack F&DIs (Govt of Sri Lanka 2007: Table 21).

The Directorate (E&OH) has been very creative in using its limited resources to offset Local Authority neglect of its environmental health and sanitation responsibilities, by strengthening the public health legislative powers of the health department vis-à-vis the Local Authorities. It made use of the Health Ministry's powers to pass regulations to prevent the spread of disease, and to specify the authority responsible for its implementation and prosecution as well as their powers. In consultation with many experts, it helped draft the Mosquito Act, which was passed in 2007. The Act provides for the control of breeding places in any place (private, public, commercial, religious, government agencies). The owner or occupier of any premises is held responsible for creating conditions favorable to mosquito breeding, and subject to fines or prosecution if they do not comply with requests to address the issue. No one is exempt, not even the chairman of the Local Authority. The powers for implementing this Act lie entirely with the health department staff (Appendix 2).

The Act defines breeding places very broadly, including for example garbage dumps and damaged or blocked drains. This covers a wide range of potential public health threats, protecting against many diseases other than mosquito-borne. It specifies that the Health Minister can publish regulations and directives with regard to breeding places and remedial measures, and guidelines on inspection and serving

notices. It thus tries to partly compensate for the fact that Local Authorities often neglect to implement the Nuisances Act, which empowers them to take action against a very wide range of potential health threats. The consequences of neglecting the Nuisances Act meant that the line agency had to control outbreaks which it was not empowered to prevent, and citizens often blamed them for the poor health conditions.

As originally passed, the Mosquito Act protected private home owners by requiring a magistrate's search warrant if they did not permit health officials to inspect their home. However, in view of the large dengue outbreaks of the past few years, the Health Minister is reportedly³⁴ seeking to amend the Act to empower MOHs, PHIs, and microbiological assistants to investigate any location without permission from the owners. Moreover, MOHs will be empowered to impose spot fines of Rs. 2,000 against the offenders. Already, during the recent intensive campaigns against dengue, many people have been fined and prosecuted for non-compliance with notices to clear mosquito-breeding places.

The Food Act also permits the health department to override the powers of the Local Authorities if needed — for example, if they tend to issue trade licenses to food vendors without the PHIs' clearance. The Act appoints Local Authorities as the Food Authorities for their territory, but if they neglect their responsibilities, the DGHS can issue them directives in his capacity as the Chief Food Authority under the Food Act. If the Local Authorities do not comply, the DGHS can take over this responsibility and appoint the local MOH as the Food Authority. In the case of municipalities, such steps are not possible, but *in extremis* the MOH can walk into the area to inspect and prosecute cases.

3.4 Public health leadership at sub-national levels

There are few incentives for MOHs to dedicate themselves to the public health sector. They are not paid more than clinicians, which would help partially compensate them for the private practice they forego as non-clinicians. Doctors are now allowed to work privately after hours, and patients are more likely to go to the doctors who treat them in medical facilities, and who have easier access to hospital facilities. During the years they are posted as MOH, their medical practice is limited largely to preventive MCH services, depriving them of the opportunity to gain experience as regular clinicians. Many of them are just waiting to be posted to the medical services.³⁵ Over time, this could dry up the supply of seasoned public health officers for public health leadership at the centre.

This does not impact so much on the MOHs involvement in services that are tightly monitored by the center, such as MCH services, epidemiological surveillance, and disease-specific programs. However, it does impact on their supervision of most aspects of PHIs' work, and more broadly their attention to their other public health duties. For example, MOHs are minimally active in providing training courses for food vendors, and in conducting medical checks on them. They are more active in school health, but fall far short of requirements even there (section 2.2.1).

Nor is there a dedicated person to supervise and provide leadership for public health work below the central level. The RDHS is responsible for both public health and medical services, and the MOHs are answerable to him/her. It would be helpful if there was one point person to lead all public health work in the district, supported by the public health staff in the RDHS office, each of whom is responsible for specific services.

The presence of such a point person for public health at district level in Tamil Nadu (the DDHS, who belongs to the public health cadre) provides strong leadership for the whole public health team of the district. They conduct annual planning for disease control and for responding to potential disasters such as floods, tailoring their planning to the circumstances of the district, and having some funds to supplement public health activities as needed. This proved invaluable for leading teams for rapid response

to the tsunami (WHO 2006). Sri Lanka's public health system is highly responsive to disasters and emergencies, as shown most recently in its management of health services for the internally displaced after the end of the civil war, but having a single person in charge of the district public health team could strengthen this further, while also improving coordination with the centre.

Tamil Nadu's public health system has other potentially useful lessons. The public health cadre is relatively small and kept incentivized through higher salaries and more rapid promotion than the medical cadre. Their MOHs belong to the medical cadre, and head Primary Health Centres where they obtain wide clinical experience as well as public health exposure before they are posted to hospitals.

Conclusions

The Sri Lankan system provides a model for other developing countries to emulate in strengthening their services for reducing exposure to disease. Critical are its strong central focal points for stewardship and support of public health services – including standardized training and recruitment – and its system of grassroots service delivery. The central funding for public health staff and services is also critical, and costs so little that this can be replicated in other countries.

Sri Lanka's public health services encompass a wide range of activities to reduce the population's exposure to disease, such as assuring disease surveillance and outbreak management, food safety, vector control, environmental sanitation, and health education. The Public Health Inspectors are well-trained to implement most of these services at community level with transparency and accountability (including supporting Local Authorities' with their environmental sanitation responsibilities). At the center, the Directorate (E&OH) is proactive in building multi-sectoral partnerships. While these services are commonplace in the developed world,³⁶ they are often neglected in the developing world.

The Directorate (E&OH) and the Public Health Inspectors are phenomenal resources by the standards of most developing countries, but they are unfortunately being neglected. A few adjustments will go far to maintain Sri Lanka as a model for other developing countries to emulate in designing their public health systems. Three suggestions follow.

First, there is a real need for establishing a full-fledged Bureau for the Directorate of E&OH – like the Family Health Bureau for MCH work, and the Epidemiological Unit – with facilities and resources for carrying out its multiplicity of tasks. It should be in a position to monitor the E&OH services performed by MOHs and their PHIs, and follow up at district level and below. PHIs and MOHs hired by Local Authorities should be included in this monitoring, to maintain full coverage of the country. Conducting audits of an infrequent event such as a death from food poisoning would keep field staff additionally vigilant, as do the maternal health audits done by the Family Health Bureau.

Second, the interface between Local Authorities and the health line agency needs to be streamlined such that the MOH is placed clearly in charge of public health activities. Local Authorities could be incentivized by having independent bodies conduct audits of environmental health and sanitary conditions in their areas, and publish the results of these audits for public review.

Third, public health leadership could be strengthened by having a point person under the RDHS, who would be responsible for overall public health planning and implementation in the district. Public health leadership could also be strengthened by creating clear incentives for some MOHs to pursue a career in public health, to assure a future stream of public health professionals for policy and planning in the central directorates.

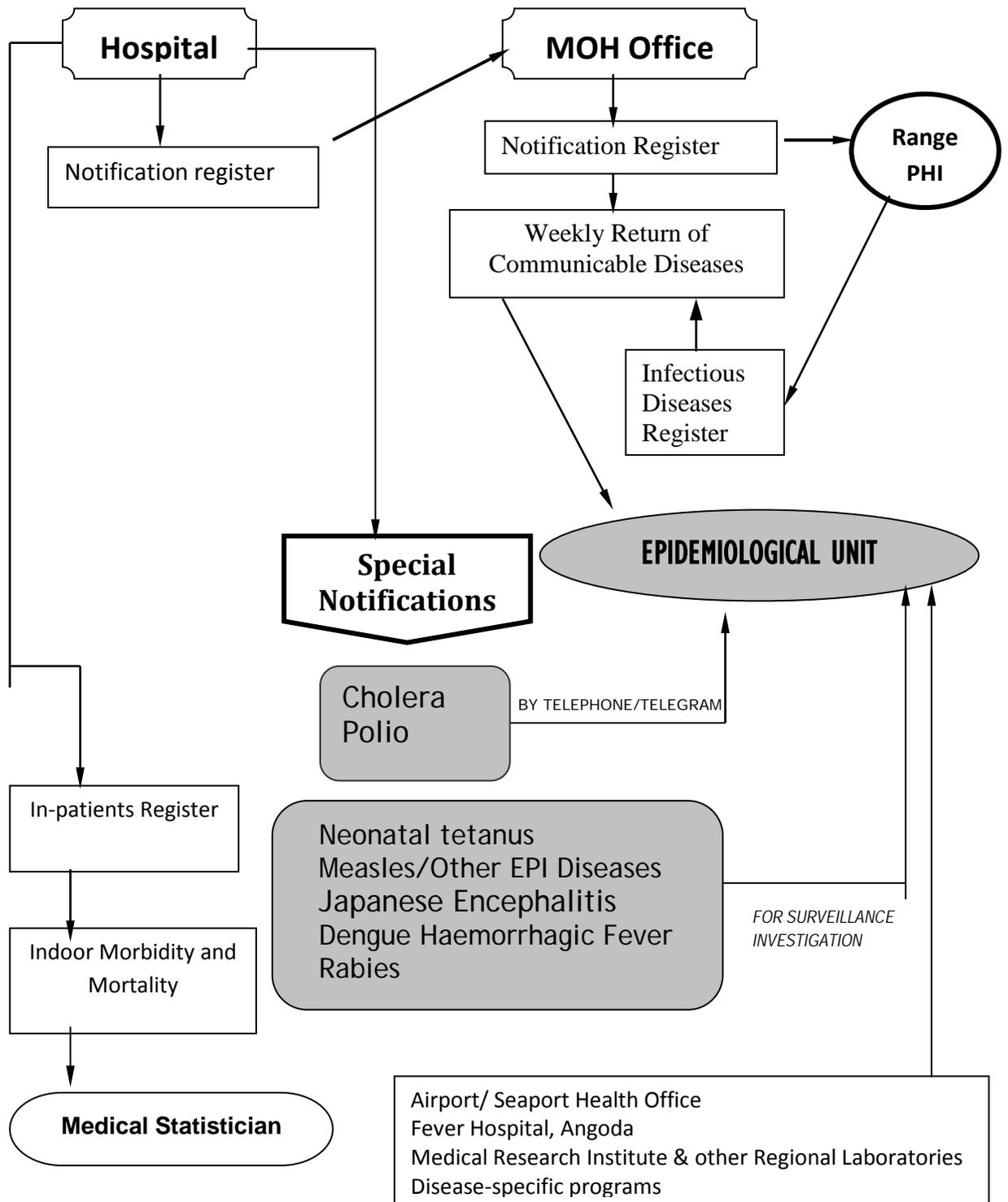
Looking to the future, the burden of disease in Sri Lanka will shift to non-communicable diseases (NCDs), and efforts to manage these diseases may be added to the tasks of the MOH unit. Certain aspects of these efforts, such as disease surveillance and more health education on NCD prevention and management, could be assigned to Public Health Inspectors. For more direct interpersonal interventions, the Public Health Midwives (PHMs) are well-trained to work with people during home visits, and the large numbers of PHMs combine with low fertility to reduce their average workload to providing antenatal and postnatal services for only 5 births per month.³⁷ As in the developed world, good public health outcomes depend on health agencies' continuing vigilance to avert the resurgence of communicable diseases that were prevalent earlier, and the emergence of new ones. Sri Lanka is fortunate to have in its Public Health Inspectors the staff trained to perform this continued vigilance, and should foster their effectiveness.

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Box 1 EPIDEMIOLOGICAL SURVEILLANCE: Mechanisms for Collecting Data



Source: Epidemiological Unit (abbreviated from their diagrams)

Box 2: Duties of “Range” Public Health Inspectors
(attached to MOH units or to Local Authorities)

- Investigate cases of communicable disease, actively from hospitals & clinics
 - act to prevent its spread, keep contacts under surveillance, trace treatment defaulters for cases of leprosy, TB, and STDs
- Food safety: inspect food vendors and advise on improving hygiene; inspect grocery stores; take samples for testing; enforce Food Act
- School health (e.g. immunization, de-worming, health education)
- Inspect homes and advise on improving health conditions (e.g. latrines, water, garbage, mosquito-breeding conditions)
- Vector control, pest control, anti-rabies measures and dog vaccination
- Specialized campaigns for disease control, when they arise
- Health education
- Disasters and epidemics: organize environmental sanitation and disease control
- Inspect factories: identify health hazards and advise on remedial measures
- Inspect plantations: advise on sanitation and control of communicable diseases
- Ensure community participation in health activities
- Maintain registers for compiling Monthly Reports of activities
- Assist Local Authorities in their environmental sanitation tasks (see Appendix 2):
 - Supervise refuse collection & disposal
 - Monitor water safety: send water samples for testing; supervise maintenance and disinfection of water supplies,
 - Monitor and improve food safety
 - Conduct inspections for building applications, trade licenses
 - Report and take action on unauthorized buildings
 - Check the sanitation of slaughterhouses, markets, fairs, medical institutions (except tertiary hospitals), burial grounds
 - Conduct general inspections of environmental sanitation (reduce “nuisances”)

Source: NIHS Kalutara, the main training institution for PHIs (abbreviated from their list of duties).

Box 3: Duties of “Hospital” Public Health Inspectors (assigned to tertiary hospitals)

- Disease surveillance and notification: inform MOH
 - For range PHIs to follow-up in community
 - Inform Epid Unit at centre (for specific notifiable diseases)
- Daily Sanitary Inspections of wards, all other areas
 - Supervise cleaning groups
 - Identify health hazards, advise remedial measures
- Infection control:
 - Check isolation and barriers to spread of disease
- Disasters & epidemics: organize measures to prevent disease spread
- Food safety: inspect hygiene of food, workers, sanitation of kitchen and other sources of food for patients and hospital staff; take samples and enforce Food Act
- Water safety: supervise cleaning water tank, take water samples for testing
- Supervise sewage system
- Waste management: supervise cleaning groups, manage disposal of all kinds of waste
- Control of vectors, pests, rabies
- Health education
- Maintain statistics and records for compiling reports on disease surveillance and all sanitary activities.

Source: NIHS Kalutara, the main training institution for PHIs (abbreviated from their list of duties).

Box 4: Issues covered during the Public Health Inspectors' basic training course

(After this 12-month course, trainees are attached for six months to range PHIs for their field practical training)

| Session Titles | | No of Days | |
|----------------|---|---------------------|---------------------------|
| | | Class Room training | Field/ Practical training |
| 1. | General Administration | 2.6 | 2.0 |
| 2. | Anatomy and Physiology | 3.8 | |
| 3. | Haematology | 2.3 | |
| 4. | Microbiology | 4.8 | 0.5 |
| 5. | Parasitology | 3.5 | 1.0 |
| 6. | Basic Bio Statistics | 3.8 | |
| 7. | Sociology | 3.1 | 4.5 |
| 8. | Simple Map Reading | 1.3 | |
| 9. | Oral Health | 2.3 | 1.5 |
| 10. | Educational Science | 2.5 | |
| 11. | Medical Entomology | 4.3 | 1.5 |
| 12. | Food Safety | 18.3 | 8.0 |
| 13. | School Health | 4.8 | 3.0 |
| 14. | Community Mental Health | 1.0 | 1.5 |
| 15. | Introduction to Environmental Health | 0.5 | |
| 16. | Human Waste Disposal | 2.3 | 3.0 |
| 17. | Solid Waste Disposal | 2.8 | 2.5 |
| 18. | Sanitation of Fairs and Festivals | 2.8 | 2.5 |
| 19. | Health Care of Refugee Camps | 1.0 | 1.0 |
| 20. | Rodent Control | 1.0 | 1.0 |
| 21. | Sanitation of natural disasters | 1.0 | |
| 22. | Sanitation of Medical Care Institutions | 0.5 | 1.0 |
| 23. | Housing Sanitation | 1.3 | 0.5 |
| 24. | Disposal of dead bodies | 1.0 | 1.0 |
| 25. | Sewage and Sewerage | 3.1 | 1.0 |
| 26. | Sanitation of Public Institutions | 0.3 | 1.0 |
| 27. | Dairy Sanitation | 1.0 | 1.0 |
| 28. | Coordination with Central Environmental Authority | 4.7 | 2.0 |
| 29. | Water Supply | 2.8 | 2.5 |
| 30. | Drugs and Related Laws | 1.8 | |
| 31. | Occupational Health | 2.0 | 4.0 |
| 32. | Plan Drawing and Plan Interpretation | 17.0 | |
| 33. | Building Construction | 6.7 | |
| 34. | Epidemiology | 17.8 | 18.5 |
| 35. | Maternal Care | 2.8 | 3.0 |
| 36. | Child Care | 2.0 | 1.0 |
| 37. | Adolescent Health | 1.2 | 2.0 |
| 38. | Elderly Care | 0.5 | |

| | | | |
|-----|------------------------------------|-----|------|
| 39. | Family Planning | 0.5 | 1.0 |
| 40. | Nutrition | 2.3 | 1.0 |
| 41. | Health Promotion and Education | 8.3 | 6.0 |
| 42. | PHC and Community Development | 4.1 | 3.0 |
| 43. | Health Planning and Management | 5.5 | 21.0 |
| 44. | Legal Measures | 8.6 | 1.0 |
| 45. | National Health Information System | 1.5 | 2.0 |
| 46. | First Aid | 2.8 | 1.0 |
| 47. | Block Field Training* | | 69.0 |
| 48. | Vaccination | | 22.0 |
| 49. | Revision | | 5.5 |
| 50. | Final Examination | | 11.0 |
| 51. | Quarterly Examinations (Five) | | 5.0 |
| 52. | Extra-Curricular Activities | | 8.7 |

* Block training is when the trainees work full time in the community along with PHI trainers, covering all the practical aspects of their training.

Appendix 1 Environmental Health Responsibilities of Local Authorities (LAs) in which Medical Officers of Health and “Range” Public Health Inspectors assist

The first four duties listed below involve the PHIs supervising laborers who remove and dispose of garbage, clean streets, maintain toilets, clean drains, and clean the premises of markets and fairs. Better-resourced LAs (Urban Councils and Pradeshiya Sabhas) may hire a Technical Officer to supervise the laborers, instead of the PHIs.

The LAs recruit, pay, and exercise administrative control over the laborers. They specify their duties and obligations. The PHIs (or Technical Officers, where these are in place) supervise the laborers, and report to the administrative authority. However, the Chairman/Mayor of the LA is very powerful and can divert them for other official work. Municipalities have their own staff for all their environmental sanitation functions, and line agency MOHs and PHIs play no role in this.

a. Markets and Fairs

LAs are responsible for maintaining sanitary conditions and cleanliness in markets and fairs (public or private). There are weekly fairs in most of the Urban Councils and Pradeshiya Sabha areas, and the vendors are taxed by the LA. The PHIs supervise the sanitary conditions, and the laborers who do the cleaning.

b. Toilets

LAs are responsible for ensuring that there are sufficient toilets in all houses and buildings within their areas, and to provide public toilet facilities at all public places, particularly in towns. They must also ensure that both private and public toilets are properly maintained and their septic tanks emptied when they are full (public sewerage systems are available only in Colombo). Where the LA does not have the equipment (called “gully bowzers”) for emptying septic tanks, they hire them from adjacent areas. PHIs oversee the laborers who conduct the toilet maintenance to keep them clean and functional.

c. Surface Water Drainage

LAs are responsible for the proper maintenance of the drainage system in their area, to prevent water stagnation with its resultant public health nuisances, particularly mosquito breeding. They have a duty by law, not only to construct and maintain drains along thoroughfares belonging to them, but also to clean the drains managed by the Road Development Authority, and to supervise the condition of private drains. The PHIS supervise the laborers who maintain and clean the drains.

d. Street cleaning, garbage collection, and solid waste management

LAs are responsible for these activities. The PHIs supervise the laborers who do the cleaning and garbage disposal, except in municipalities which have separate engineering departments for this. The PHIs may be assisted by a sanitary overseer where funds are available for hiring them.

Few LAs have a proper waste management system. Waste is dumped in specified locations, often in low-lying areas, usually away from residential areas. The Colombo Municipal Council has the technical information for proper waste management (including segregating waste, recycling,

reuse, biofuel and safe disposal of collected garbage), but few LAs have this know-how. Pressed for space for disposing garbage, many LAs are now attempting to recycle solid waste and composting organic matter, especially in more densely built-up areas where more waste is generated. PHIs do not have a role in designing waste management.

e. Nuisances

Under the Nuisances Ordinance, the LAs are responsible for having their area periodically inspected by the PHIs, to identify potential threats to public health. The LA has the power to redress these nuisances. For example, they can ask the owner of any private land to clean up tanks, marshy ground, waste or stagnant water, which would appear injurious to health. Should they fail to do so, the LA can have the clean-up work done by its own employees and recover the cost from the owner. The PHI can also make independent inspections, as described in Appendix 1 along with the procedures for follow-up action.

The LA is also responsible for preventing bathing or washing of animals, vehicles or clothes in any public place which is not set apart for that purpose. This also applies to pollution of streams caused by factories.

f. Insanitary Buildings and Building Plans

LAs are responsible for having dilapidated buildings removed or repaired, through the occupiers or owners. If they fail to comply, the LA can have it done and recover the cost from the occupier/owner. Action can also be taken to prevent overcrowding in houses and persons responsible for overcrowding can be prosecuted.

In smaller towns and rural areas that come under the Housing and Town Improvement Ordinance, the MOHs and PHIs are involved in recommending approval for buildings applications submitted to the LA. Building plans are reviewed by the Planning Committee and the decisions submitted to the Chairman for final approval. PHIs also report unauthorized constructions to the LA.

LAs under the Urban Development Authority Act have their own staff to take care of housing and town planning, and the participation of the MOH/PHI is minimal.

g. Slaughter Houses and Meat Safety

LAs are responsible for ensuring that meat is safe for human consumption, under the Butchers Ordinance, which the LA implements through the PHIs. Only premises approved and licensed by the LA are allowed to be used as slaughter houses, and butchers must be licensed. Meat is allowed to be sold only in meat stalls approved by the LA. Meat vendors have to comply with conditions stipulated in the by-laws regarding maintaining a meat stall.

The Colombo Municipal Council has a separate veterinary department responsible for such inspection. In Pradeshiya Sabhas and urban Local Authorities without a veterinary department, PHIs are responsible for checking slaughterhouses and meat inspection. PHIs can inspect meat at the point of sale, and also check whether the meat is from animals approved for slaughter. If meat is transported from elsewhere, they can check whether it is correctly transported to maintain

its safety for consumption. It is illegal to transport meat without proper documentation. However, there are major gaps in the inspection of meat and slaughterhouse maintenance.

h. Trade licenses:

LAs issue trade licenses for a fee, renewable yearly. Surveys are carried out to assess the number and status of trade premises. Applications for renewing licenses are sent to the PHI for inspection and recommendation, and they are expected to complete inspections within two weeks. When lapses are pointed out, some trade premises may disregard them and fail to take remedial action, but nevertheless be granted the license. This indicates that LAs are sometimes more interested in collecting the fees than in ensuring safe trade practices.

i. Food safety and water safety

The PHIs guide the food vendors in improving their hygiene, and sometimes take food samples for testing. The cost of food sampling (paying for the food sample taken) is borne by the LA. If the sample is found by the public health laboratory to be unsafe, the PHI will prosecute the case himself.

PHIs are also involved in assuring water safety, and take water samples for testing from all sources of drinking water. However, different Acts apply depending on the source of water. In the case of bottled water, the PHI can have samples tested and prosecute under the Food Act if the sample was found to be unsafe.

In the case of wells, PHIs check that wells are protected, and ensure that they are chlorinated if needed (for example after a flood or if there is an outbreak of gastro-enteric disease). If community wells are found to be contaminated, the PHI can seek to address the source of contamination under the Nuisances Ordinance.

In the case of pipe-borne public water supply, the provider (the National Water Supply and Drainage Board) does routine sampling and analysis. PHIs can take independent water samples for testing, as a cross-check, and if a problem is found he will notify the Regional Engineer of the NWSDB to take action. He cannot prosecute.

j. Other activities

The PHIs play an active role in helping LAs implement other environmental health and disease control activities, such as the Rabies Ordinance, and the Cemeteries and Burial Grounds Ordinance.

Appendix 2: Public health legislation

Beside the Local Authority (LA) Acts, there are many laws to protect public health and environmental sanitation. The key ones pertaining to communicable disease control are listed here.

The LAs have power over the enforcement of many of these laws, including:

- The Nuisances Ordinance, which permits the regulation of virtually any activity/issue that could affect public health. If there is a public complaint or the PHI notices a nuisance, he can investigate it and if remedial measures are needed can notify the offender to carry them out. In case of noncompliance he can recommend prosecution through the MOH to the LA Chairman, whose sanction is mandatory for prosecution. If given the sanction, the PHI prepares the charge sheets, appearing in court as a prosecuting officer without the support of a lawyer.
- The Food Act, which regulates food quality and specifies food standards, safety and hygiene. The Director General of Health Services is the competent authority for its implementation. The authorized officers are Medical Officers of Health, Food and Drug Inspectors, Public Health Inspectors, and Food Inspectors of a Municipal Council. The LAs are the appointed Food Authorities for their respective areas of administration, but PHIs can prosecute independently under the Food Act.
- The Rabies Ordinance, which provides powers for dealing with stray dogs, and requires owners to report if they are aware that their dog is diseased. The implementation authority is the local government, and enforcement is by Public Health Inspectors, police officers and Village Headman.
- The Butchers Ordinance, which regulates slaughterhouses, licensing of butchers, and the fitness of meat for human consumption. The LA delegates implementation powers in writing to the Public Health Inspector.
- The Housing and Town Improvement Ordinance, which regulates habitable dwelling in Pradeshiya Sabhas. The Ordinance addresses building approvals, issue of certificate of conformity, unauthorized buildings, insanitary dwellings, streets and street lines, standards for the buildings, rooms and streets. The PHI has to be authorized by the chairman of the Pradeshiya Sabha to carry out his duties under this Ordinance.

In areas under the Urban Development Authority Act, the LA has its own officers for implementing housing and town planning, so the participation of the MOH and PHIs is minimal.

- The Cemeteries and Burial Grounds Ordinance, which specifies standards and the penal provisions and powers of courts. The proper authority for implementation is the LA, while the PHI is responsible for inspecting the areas.
- Municipal/ Suburban Dairies and Laundries Ordinance, which sets standards for regulating these. If the PHI identifies potential health threats, he reports it to the MOH, to relay to the Mayor, who is the Competent Authority.

The health authorities are the designated authority for few laws. These include:

- The Quarantine and Prevention of Diseases Ordinance, which gives the Health Minister the power to pass regulations as needed to prevent the spread of disease, and to specify the authority responsible for its implementation and prosecution as well as their powers. Regulations made under this

Ordinance include those on notifiable diseases, quarantine, the storage of grain, hookworm, and the recent Mosquito Act of 2007.

- The Contagious Diseases Ordinance empowers the Health Minister to specify which contagious diseases are notifiable (in addition to smallpox and cholera) and to publish this list. Failure to report these diseases is subject to fine in a magistrate's court. The Local Authorities are the main designated authority for implementing this Ordinance.
- The Prevention of Mosquito Breeding Act, which provides for the control of breeding places, covering not only private residences, trade premises and construction sites but also public institutions, religious institutions and public places (which include markets and roadsides with garbage dumps and damaged or blocked drains). This covers a wide range of potential threats to environmental sanitation, and thereby protects against many diseases other than mosquito-borne.

The Act places the onus of responsibility on the owner or occupier of any premises, not to create conditions favourable to the breeding of mosquitoes. The term "owner" is so broadly defined as to include the chairman of the LA and hold them liable for prosecution. The Act specifies that the Health Minister can publish regulations and directives with regard to breeding places and remedial measures, and guidelines on inspection and serving notices.

The competent authority responsible for implementation is the Director General of Health Services (DGHS). The DGHS can delegate his authority to a Medical Officer of Health (MOH) or Public Health Inspectors (PHI) in any MOH area. The PHI is the inspecting officer and prosecuting officer, but requires the sanction of the MOH to prosecute. The DGHS is involved only if the MOH disagrees with the PHI's recommendation for prosecution. The Act stipulates penal provisions for noncompliance or obstruction of duty. However, the PHIs are expected to rely heavily on health education to alter people's behaviors, and mobilize communities to cleaning the environment when needed. The Act is intended to be a measure of last resort.

Another Act that helps protect environmental health is the National Environmental Act. This provides for creating authorities down to district level for protecting and managing the environment, which include representation from many sectors including the Health Ministry. Regulations can be framed by the Environment Minister. This Act has been in operation since 1980, and covers a wide range of issues including air, soil, and water pollution.

Most of the legislation pertaining to communicable disease prevention and control was originally passed during the colonial era, and has been updated since. Meanwhile, legislation pertaining to the control of non-communicable diseases is being gradually extended. For example, an Act was passed in 2006 for controlling alcohol and tobacco, and a National Tobacco and Alcohol Authority established to oversee this. However, the Health Ministry has been proactive in establishing District Tobacco Control Cells under its leadership, as described in section 1.4.

Endnotes

¹ **Disclaimer:** These are the authors' views and should not be attributed to the World Bank or any affiliated organization or member country.

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² World Bank 2007a, WHO 2007a

³ FAO/OIE/WHO 2011, World Bank 2007a

⁴ Barnett et al 2003, Milne 2003, Novick and Morrow 2008, WHO 1978.

⁵ See for example Easterlin 1999, Ashton and Seymour 1988, and United States Centers for Disease Control 1999. Until the therapeutic advances of the mid-twentieth century, these were the most effective way for elites to protect themselves from diseases spreading from neglected groups or areas.

⁶ United States, Tennessee Valley Authority n.d.

⁷ See for example Jamison et al (eds) 2006, World Bank 2007a, and WHO 2007a.

⁸ In \$ terms or when adjusted for purchasing power parity in 2005.

⁹ <http://databank.worldbank.org>, accessed 2 August 2012

¹⁰ Total health expenditure was estimated to be 4% of GDP in 2007-11 (World Bank Databank <http://data.worldbank.org/indicator/SH.XPD.TOTL.ZS>, accessed 15 April 2012). In 2008, 5.12% of this budget was estimated to be spent on public health services (De Alwis, Fernando, and Rannan-Eliya 2001: Table 8).

¹¹ World Bank 2007b, World Bank Databank <http://data.worldbank.org/country/sri-lanka>, (accessed 15 April 2012).

¹² These include Dental Services, Biomedical Services, Management Development and Planning (MDPU), Education, Training & Research (ET&R), Finance & Accounting, and various aspects of general administration.

¹³ Dental surgeons and those from the veterinary services can also apply for administrative posts.

¹⁴ Up to 1988, the administration of the state services was managed directly by the center through a three-tiered, decentralized system (central, district, and divisional levels). Then a Constitutional Amendment devolved many central-level powers to the provinces. This gave the provincial authorities some influence in health policy implementation, as they control the funds allocated for public health services and have direct administrative control over the key public health staff – though the latter are line agency staff who may eventually be promoted to the centre. This includes the provincial and regional (district) Directors of Health Services (PDHS and RDHS)

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- and their staff, and the MOHs and their staff. The RDHS are in charge of districts, of which there are 25 in the country. The medical and dental services are nation-wide services, all others belong to Provincial services unless they are promoted to the central level.
- ¹⁵ The first MOH unit was established in 1926 – with much the same categories of staff as today – and gradually expanded since to function in much the same way through several policy changes (De Silva 1956, Herath 1996).
- ¹⁶ Source: De Alwis, Fernando, and Rannan-Eliya 2011, Institute for Health Policy 2008, and Dalpatadu et al 2008.
- ¹⁷ Between 1990 and 2008, total health expenditures rose over 12-fold. However, the share of preventive health services fell from 8.7% to 5.2% of total health spending, as outlays on medical services rose sharply – notably inpatient care expenditures which rose from 21.5% to 32% of total health spending (De Alwis, Fernando, and Rannan-Eliya 2011: Table 8).
- ¹⁸ In 2008, the central government provided 66% of total health spending (preventive and medical) in the public sector was 66% directly by the Central government, 32% by the Provincial governments, and 2% by the Local Authorities (LAs).
- ¹⁹ ESCAP (no date) cites the 1996 Finance Commission, saying that 90% of urban Local Authorities funds derive from grants disbursed by the Finance Commission through the provincial councils.
- ²⁰ Source: Institution for Health Policy (IHP) 2008 Sri Lanka Health Accounts Draft Estimates
- ²¹ The remaining Directorates are for Quarantine, Public Health Nursing Services, Nutrition, Estate and Urban Health, and YEDD (Youth, Elderly, Disabled and Displaced).
- ²² For example, many of the MCH activities receive donor support, from sources such as UNICEF, WHO, World Bank, UNFPA, and UNHCR. The Epidemiology unit has been strengthened by donor interest in disease surveillance as well as in immunization (for which they handle vaccine procurement, distribution, and implementation schedules).
- ²³ However, the response rate for reporting from the private sector is low.
- ²⁴ Historically, the exceptions are the PHIs working for the Municipalities of Colombo and Kandy, though these municipalities would presumably send the Monthly Reports if asked to do so.
- ²⁵ Forthcoming report
- ²⁶ www.daph.gov.lk (accessed 4 February 2012). Robertson et al (2010) report that field veterinarians are using mobile phones to report animal health information
- ²⁷ <http://www.nata.gov.lk/images/stories/Circular.pdf>, accessed 2 August 2012.
- ²⁸ The PHI report form used by the Colombo Municipal Council offers a concise form for this.
- ²⁹ The central government decides on the structure of a local authority and demarcates it after a process of consultation and consensus with various stakeholders such as political parties, organizations, and citizens.
- ³⁰ Colombo and a few other large Municipal Councils established environmental sanitation programs in the mid-nineteenth century.
- ³¹ There are similar shortfalls in other categories of staff to support environmental health work, such as Entomological Assistants (Govt of Sri Lanka 2007: Table 21).
- ³² http://www.daph.gov.lk/web/index.php?option=com_content&view=article&id=91&Itemid=187&lang=en (accessed 4 February 2012)
- ³³ http://www.daph.gov.lk/web/index.php?option=com_content&view=article&id=186&Itemid=93&lang=en (accessed 4 February 2012)
- ³⁴ http://www.colombopage.com/archive_11A/Jul03_1309666307KA.php (accessed 4 February 2012)
- ³⁵ The introduction of an MSc in Community Medicine may motivate some to enter the public health stream, but financial and other incentives are needed to compensate them for foregoing private clinical practice.
- ³⁶ Barnett et al 2003, Milne 2003, WHO 1978.
- ³⁷ Annual Health Statistics 2007, Tables 4 and 20.