Supplementary figure 3: Recommendations for the development of a national mortality surveillance system

District level

The first step in developing mortality surveillance is to analyse community capacity (Box 1). There is great variation across the country and therefore it will be important for each district to assess how functional the various potential notifying agents are likely to be in their ward communities.

Box 1. Situation analysis of District Capacity

Population for Local Level Government areas (LLGs) and wards (from census data)

Settlement patterns

Modes of transport and travel times

Distribution of and access to health services

- Population < 2 hours travel from nearest functioning health facility

Communications availability

Potential notifiers: numbers and distribution of:

- Functioning ward development committees
- Functioning ward recorders
- Churches that conduct baptisms and funerals. Do they keep written records?
- Teachers
- Village health volunteers; other health workers
- Village court officials such as magistrates or court clerks
- Village chief or an elder of a clan/tribe or ILG

Criteria for Notifying Agents are being defined in the Regulations to the new CR Bill and include multiple individuals of standing in the ward, such as ward recorders, ward councillors, peace officers, village health volunteers and teachers. Combining the legal requirements with the local situation analysis, should facilitate the process of establishing a district notification system, the outline for which is shown in Box 2. Making use of current infrastructure will be important for affordability and sustainability, for example, health workers conducting immunization clinics could take the opportunity to notify non-facility births and deaths in infants and young children.

Box 2. Establishing a District Notification System

- Situation analysis
- Selection of notifying agents, by category, for the district based on the situation analysis (Box 1)
- Tasks of notifying agents are to:
  - Collect details of community (non-facility) births and deaths
  - Notify local health facility of details
  - Maintain community records, e.g. ward record book, church or local court registers
- Development of systems for communicating results to health facilities
  - Mobile phones (provide hardware)
  - Paper-based (provide materials)

Local health facility

The local health facility should organise data collection that will be transmitted through the electronic National Health Information System (eNHIS) for monitoring and assessment at both the provincial level and the Performance Monitoring and Research Branch (PMRB) at the National Department of Health (NDOH). We have developed training materials for technical aspects of mortality surveillance, including refresher courses; training may also be necessary in facility management. Understaffing and recurrent crises, such as disease outbreaks, place facilities under stress. The success of the mortality surveillance system will depend on the presence of supported, well-motivated staff in the health facilities, as well as in the community to provide notifications. Feedback of results to facilities and community leaders will be imperative to maintain staff motivation. Key requirements for mortality surveillance at the local health facility level are highlighted in Box 3.

Box 3. Local health facility

- Supervise and train notifying agents
- Collect details of in-facility births and deaths and enter into e-NHIS
- Collect notification reports of non-facility births and deaths and enters into e-NHIS
- Develop means to collect non-facility events through outreach services
- Assess coverage by notifying agents
- Screen notifications for duplicates; should be flagged by eNHIS software
- Plan collection of verbal autopsies (VAs)
- Collect VAs within 12 months of death
- Combine VA collection for non-facility deaths with outreach, e.g. maternal and child health clinics

Collect VAs for all non-facility deaths

Collect VAs for in-facility deaths and persons dead on arrival if no medical officer or trained health extension officer (HEO)

Collect MCCODs for in-facility deaths if medical officer or trained HEO present

Inform provincial health services and PMRB of details of MCCOD through eNHIS

Details of VAs transmitted through e-NHIS for analysis at PMRB

Organise discussion of analysed local mortality data with VA interviewers as well as community leaders and notifying agents

Above tasks to be incorporated into duty statements of health workers

Provincial health services

Provincial Health Authorities (PHAs) should establish a team for the analysis and interpretation of morbidity and mortality data collected through e-NHIS. This might include the Provincial Health Information Officer (PHIO), field epidemiologists, the clinical information service and disease control staff. Such a group needs to act as secretariat for a provincial committee to oversee morbidity and mortality surveillance, as outlined in Box 4.

Box 4. Provincial health services

Require PHAand e-NHIS to be in place

Provincial master trainer, supervisor and district field coordinator for mortality surveillance activities

Rollout of mortality surveillance in the province including training on vital event notification, VA and MCCOD

PHIO monitors data collection using eNHIS

Analysis of notification and MCCOD data prepared for provincial committee

Provincial committee established to oversee morbidity and mortality surveillance

Receive feedback from PMRB, Port Moresby

Report back to health facilities and LLG administration, including analysed data

Performance Monitoring and Research Branch

PMRB requires staff to support coding and quality assessment of MCCODs, as well as for broader mortality data analysis and interpretation, especially as these data are expected to become available in a more complete and timely manner with the current rollout and expansion of eNHIS capabilities. Expected mortality surveillance requirements of PMRB are listed in Box 5.

Box 5. PMRB

- Additional staff requirements: national epidemiologist, statistician, mortality surveillance technical advisor and ICD mortality coders
- Train and supervise VA and MCCOD master trainers
- Produce and supervise training programs, developing a cadre of master trainers
- ICD coding and quality assessment of MCCODs
- Quality assessment of VAs
- Manage and oversee mortality surveillance using eNHIS
- Analysis and interpretation of VA and MCCOD data
- Report back to PHIOs
- Prepare data for National Burden of Disease Committee
- Report to Secretary for Health

National Burden of Disease Committee

This national committee oversees mortality surveillance programs in the country and critically reviews the data collected. One of the most important roles of this committee will be advocacy: to the health professions, to the universities, and to health services generally. It will, at least initially, require external support in the technical aspects of its work, outlined in Box 6.

Box 6. National Burden of Disease Committee

- Provide oversight of training, rollout, and performance of mortality surveillance activities
- Review and interpret morbidity and mortality data reported by e-NHIS
- Review data for the NDOH Sector Performance Annual Report (SPAR)
- Review data from other sources, e.g. disease control programs, and specialist societies
- Produce an annual report to the Health Secretary about PNG burden of disease estimates and data quality
- Provide an annual report to the Medical Society of PNG
- Advocacy through the specialist societies
- Feedback analysed data and liaise with PHAs
- Liaise with international bodies