# HRF
## Health Resource Facility

# Economic Inputs to the Timor Leste Health Design

## Final draft

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# Contents

# Acronyms

| | |
|---|---|
| AARD | Average annual rate of decline |
| ANC | Antenatal care |
| AIDS | Acquired immunodeficiency syndrome |
| BCC | Behaviour change communications |
| BSP | Basic service package |
| CMR | Child Mortality Rate |
| DFAT | Department of Foreign Affairs and Trade |
| EmOC | Emergency obstetric care |
| GAVI | Global Alliance for Vaccines and Immunisation |
| GFATM | Global Fund to Fight AIDS, Tuberculosis and Malaria |
| GHE | Government Health Expenditure |
| HIV | Human immunodeficiency virus |
| HSS | health system strengthening |
| IMR | Infant Mortality Rate |
| MDG | Millennium Development Goals |
| MMR | Maternal Mortality Rate |
| MoF | Ministry of Finance |
| NHSSP | National Health Sector Strategic Plan |
| NMCH | New Born Maternal Child Health |
| NNMR | Neonatal Mortality Rate |
| PPP | Purchasing Power Parity |
| RMNCH | Reproductive, maternal, newborn, and child health |
| SAMES | Servico Autonomo de Medicamentos e Equipamentos de Saude |
| TB | Tuberculosis |
| TLDHS | Timor-Leste Demographic and Health Survey |
| UNTL | National University of Timor-Leste |

# Executive Summary

This report is an economic analysis to complement the project design for the Australian aid Timor-Leste Health Program 2013-2021. The Scope of Work asked to provide guidance on selecting program components from an economic perspective, as well as providing a strategic analysis of the investment environment from the perspective of cost-effectiveness and value-for-money, the aims of the Program, poverty alleviation, and the overall effectiveness of the Program in supporting the government to deliver effective and responsive health services. This report is focused around addressing two specific questions (outlined below).

The current design strategy focuses on strengthening the Timor-Leste health system by addressing identified health system weaknesses and supporting service delivery. The strategy envisions new and different ways of working with the MoH and other development partners.

**Methodology:** Reports and data from Timor-Leste were reviewed and supplemented by information provided by Australian aid Dili health staff members. After an intensive review of the global literature and finding little information on evaluation of health systems strengthening (HSS) interventions, a conceptual model was developed to help prioritise Program activities. Several prior studies on health financing in Timor-Leste were updated with data from the 2014 government budget, and new analyses were made of current data that also incorporated findings of recent studies.

*What sorts of interventions are likely to be most effective in the short and long term at improving maternal, child and neo-natal health in Timor-Leste? How would they improve health care access and/or quality in the long-term, or will they only work in the short-term?*

The National Health Sector Strategic Plan (NHSSP) identifies some weak links in the Timorese health system and outlines a plan to address them, in three phases through 2030. The Australian aid program will carry on through only the first part of the second phase. Since not everything can be done at once, the Program design must balance cost, time-frame, relative importance, and likelihood of achieving the needed short-term and long-term impacts in selecting priority activities. Some initial activities have been described in a Project Note which summarises discussions to date between the Timor-Leste Ministry of Health and Australian aid (Annex 2). These activities have been selected on the basis of high-level political ownership, potential for quick results and likelihood of leading to service improvements by unblocking bottlenecks, and (thus far) leaves the content and details of remaining longer-term activities to an ongoing project design process.

This will be complicated by the fact that documentation and systematic reviews that provide evidence for prioritizing inputs and activities are lacking for most types of HSS interventions. A model that estimates the potential impact of reproductive, maternal, neonatal and child health (RMNCH) interventions was adapted to evaluate HSS interventions. The total numbers of avoidable premature maternal, neonatal and child deaths and disabilities are calculated, which then correspond to benefits if the health system performed optimally, including the marginal benefits from strengthening and improving access to higher levels of care.

Rural access to RMNCH services is a known weak link in service delivery. Although requiring several assumptions, ambulance repair provides an illustration of how benefits may be attributed to a specific HSS intervention. If the relative influence of every other system bottleneck were known, benefits could be estimated for strengthening other weak system links. Although very hypothetical and requiring assumptions where data is unavailable, it can provide a 'first cut' to quantify and prioritise interventions. Strengthening some parts of the health system might have no direct linkage to health outcomes, but it is nonetheless likely that alleviating critical shortages of human resources and increasing utilization by means of behaviour change communication, are at least as important as emergency transportation.

***How efficient is current government allocation and expenditure for health? How could government better use the $60 per capita spent to improve maternal and child health outcomes, and how is it currently spent?***

Efficiency criteria and financing trends were examined and Timor-Leste was compared with other countries. Several regional countries spending considerably less on health than Timor-Leste have lower maternal mortality rates. For 'fragile states' such as Timor-Leste in the Asia-Pacific region, health expenditures and life expectancy are closer to the lowest-income countries, and are considerably lower than the region's middle-income countries. Comparing Timor-Leste with 20 countries having similar low levels of government health expenditure (GHE) found that it has lower child mortality than expected and average infant mortality.

Total health expenditure which includes private spending as a percentage of gross domestic product (GDP) has shown a long-term decreasing trend partly due to rapidly rising GDP, but recent actual and planned increases in the health budget have raised it above 5% again. Budget allocation to salaries and wages has especially increased recently in accordance with new personnel policy, and government spending on drugs and supplies of about $5 per capita is similar to other low and middle-income countries. Only 38.7% of the health budget is spent at sub-national (district) level, reflecting diseconomies of scale in a small country that make overhead costs relatively high, but most small countries in the region have much higher health expenditures. Allocation of the recurrent budget appears to be related more closely to the current operating costs of existing district health facilities rather than to the needs of the population.

Out-of-pocket spending is low, and utilisation of district-level health facilities is relatively equal among income groups but higher-income households make more use of hospitals than the poor. Access and availability of services are more significant constraints to utilisation than financing *per se*.

Both government and development partners are giving high priority to capital investment in infrastructure and human resources for health, with government capital spending equal to almost half of the recurrent budget, mostly for current hospital construction. About one-third of aid to the health sector is used directly at district level. Donor spending in the health sector is still far from transparent, and may be uncoordinated with MoH budgeting. The lack of robust data makes it very difficult to make conclusions about the efficiency of total public spending on health.

**Main Conclusions:**

1. The health system support activities proposed under the Program are likely to be worthwhile in the short term if they are targeted carefully to priority needs. Repairing ambulances can be a very efficient use of resources when the health facilities are otherwise capable of delivering services. Filling gaps in critical human resources should be very useful but there are unanswered questions concerning the feasibility of the recruitment and support of Indonesian staff. Other health system building blocks that are not now addressed by other programs could also be supported by building capacity, but piecemeal interventions to strengthen weak links in the health system will not improve health outcomes unless they result in capacity to plan, implement, and sustain activities and adapt to changing conditions. There is a tradeoff between applying immediate solutions such as providing badly needed infrastructure, and making investments that take longer and are more costly but are more likely to have a lasting impact.

2. Current government health expenditure is rather low but is not the only factor holding back rapid progress toward health goals. The gap between the potential of technical interventions to improve health and actual RMNCH outcomes is due mostly to weak links in the health system. The critical need for health system improvements to meet the millennium development goal (MDG) targets including those for RMNCH is documented globally and is estimated to cost much more than the technical interventions.

3. Timor-Leste gets reasonably good results from government health expenditures, although it is difficult to assess this when the health system is in a state of rapid development and needing high capital investment. The efficiency of budget spending also may be limited to an extent by the unavoidably high proportion going to central administrative and technical directorates. Some important health interventions such as water and sanitation may be underfunded but are outside the scope of MoH functions.

4. Development partners will provide less health financing in coming years than in the past, about $32 million in 2014. When added to the government health budget of $60 million, this raises total public health expenditure to about $82 per capita in the coming years. A needs-based costing of Timor-Leste health facilities determined that by 2014 a basic service package (BSP) would cost $28 per capita (including referral hospitals), rising to $35 as coverage and population increase. While a WHO global estimate for all LMICs should not be taken to represent Timor-Leste's investment needs, costs of accelerated progress to meet the health MDGs could cost an additional $30-$40 per capita for infrastructure, human resources and other system strengthening. Even with relatively high MoH overhead costs, current spending levels of $82 per capita should cover required funding for the BSP, but spending on the investments needed for accelerated progress is likely to fall short of needs. The GoTL has demonstrated the political will to finance both cost-effective technical interventions and HSS interventions while also investing in human and physical capital, but its limited contributions may prevent more rapid progress. The chosen strategy for the new up to A$50 million Australian aid program appropriately focuses on investment gaps, and will increase total health financing by almost $10 per capita.

# 1. Introduction

This report is an economic analysis to help the Australian aid program complete the project design for the Timor-Leste Health Program 2013-2021. The Scope of Work which was refined based on discussions with Australian aid's Senior Health Specialist in Timor Leste asked the Consultant to provide guidance on selecting program components from an economic perspective. It is also meant to be a high-level strategic analysis of the investment operating environment, from the perspective of cost-effectiveness and value-for-money, the aims of the Program, poverty alleviation, and the overall effectiveness of the Program in terms of supporting the government in delivering effective and responsive health services.

The Australian aid Delivery Strategy[1] defines the outcomes of the planned new health program as: a) households, especially the most vulnerable, increasingly practice behaviours that are conducive to better maternal and child health and nutrition; b) increased use of reproductive, maternal, newborn and child health services; and c) improved equity and overall population improvement with respect to the previous two outcomes.

The original Scoping Note for this assignment (Annex 1) called for an economic analysis that addresses the following questions:

1. What is the existing situation of the 'market' for health services in Timor-Leste? In what ways is it succeeding, in what ways is it failing, and why?

2. What sorts of interventions are likely to be most effective in the short and long term at improving maternal, child and neo-natal health in Timor-Leste? How would they improve health care access and/or quality in the long-term, or will they only work in the short-term? (Note: Summarising what is known internationally and in Timor about cost-effectiveness of RMNCH interventions. Use this information to propose possible prioritisation of RMNCH interventions to meet Timorese health needs.)

3. How could the most effective portfolio of demand-side and supply-side interventions be determined?

4. How efficient is current government allocation and expenditure for health? How could government better use the US$60 per capita spend to improve maternal and child health outcomes, and how is it currently spent?

5. Is current and forecasted government and donor health allocation and expenditure sufficient to meet Ministry of Health 2017 targets?

The current design strategy focuses on strengthening the Timor-Leste health system by addressing known health system weaknesses[2], placing emphasis on supporting service delivery, developing the health workforce, promoting community mobilisation, and improving health sector governance. It leaves to a continuing design process the details of how interventions will be designed and implemented.

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[1] AusAID (2013) Timor-Leste Health Delivery Strategy: 2013 – 2020

[2] The WHO health system model was used in the Project concept, with the addition of Community Mobilisation as a seventh 'building block'.

Current government health expenditure is lower than some comparable countries in the region[3] but appears adequate for the present infrastructure and human resources. The new health program will significantly augment government health expenditures. Rising national income leaves fiscal space for increased health financing, but this is not the only factor holding back rapid progress toward health goals. The basic strategy is to build health system capacity to deliver effective interventions, implementing as much as possible through existing structures and programs that will remain in place over the long run.

The draft Project (Investment) Design (October 2013) focuses on overcoming organisational and institutional weaknesses that have hindered past attempts to implement policies to ensure that increasing resources translate into higher supply and demand for quality health services. The project strategy envisions new and different ways of working with the MoH and other development partners.

## 1.1. Research Development and Methods Used

After reviewing the Project planning documents provided by Australian aid and doing a literature search, an Analytical Plan was sent to Australian aid on October 23. Following submission of the plan it was agreed with Australian aid Dili that the report should focus only on Questions 2 and 4. During this period the Consultant was advised to make special reference to the project activities mentioned in a recently prepared (undated) Project Note (Annex 2 describing tentative agreement between Australian aid and the MoH. An intensive review of the literature on these priority issues was made, and all available reports from Timor-Leste were also reviewed. A set of supplementary questions was e-mailed to Australian aid Dili health staff members. Not all questions were answered in time to be included in this report[4].

The Scoping Note for this assignment refers to reproductive, maternal, newborn, and child health (RMNCH) interventions without specifying whether technical or health system strengthening (HSS) interventions were under consideration, whereas the Project Note and the more recent project design documents concentrate largely on HSS interventions. The initial activities described in the Project Note were selected on the basis of high-level political ownership, potential to show quick results, and likelihood of leading to service improvements by unblocking bottlenecks. Only the last of these criteria is appropriate for economic prioritisation. It was agreed that if cost-benefit analyses could not be done for the proposed interventions, estimates should be made of potential effectiveness.

Although effectiveness of interventions and effectiveness of budget allocation are nominally different issues, they are closely related. The following analysis connects them by noting that increased spending on health usually does not produce commensurate results due to constraints resulting from health system weaknesses. However, piecemeal interventions to strengthen weak links in the health system will not improve health unless they result in capacity to plan, implement, and sustain activities over the long-term and adapt to changing conditions. There is a trade-off between applying immediate solutions such as providing badly needed infrastructure, and making investments that take longer and are more costly but are more likely to

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[3] D. Whitaker, V. Walford and B. David (2013) Health care financing in the Asia Pacific region , HLSP Institute
[4] Replies are referenced in the report by (Australian aid Dili health staff).

have a lasting impact. The possibilities for conflict between these needs challenge Australian aid to provide assistance in ways that have both immediate and lasting impacts on RMNCH outcomes.

# 2. What sorts of interventions are likely to be most effective in the short and long term at improving maternal, child and neo-natal health in Timor-Leste? How would they improve health care access and/or quality in the long-term, or will they only work in the short-term?

## 2.1. The importance of balancing investing in health systems and investing in technical health interventions

A relatively small number of health conditions are responsible for most of the burden of avoidable mortality in low and middle income countries, and effective interventions exist to prevent and treat most of these. Scaling up these interventions faces a number of challenges and constraints. Development agencies have traditionally supported counterparts with resources for the delivery of a single or limited set of evidence-based interventions. Many preventive and primary curative interventions are believed to prevent a large fraction of maternal and child deaths for as little as US$10 to US$1000 per death averted, but econometric models of health expenditures and indicators find an enormous gap between the degree to which public spending *potentially* improves health status and the *actual* performance. Cross-national variations in health spending account for only a very small part of differences in health outcomes[5], with most (95%) of the variation in the infant mortality rate (IMR) and child mortality rate (CMR) due to other factors[6]. In contrast to the high cost-effectiveness of individual interventions, as illustrated in Table 1[7], the net effect of total public expenditures on health was found to be very low, in the range of US $50 000 to US $100 000 per child death prevented.

**Table 1: "Best Buy" health interventions in South Asia**

| Health intervention | Cost (in US$ per DALY averted) |
|---|---|
| Childhood immunisation | 8 |
| HIV/AIDS prevention | 9-126 |
| Surgical services and emergency care | 6-212 |
| Tuberculosis (prevention and treatment) | 8-263 |

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[5] D. Filmer, J. S. Hammer, L. H. Pritchett  (2000) Weak Links in the Chain: A Diagnosis of Health Policy in Poor Countries The World Bank Research Observer, vol. 15, no. 2

[6] These were average income level, distribution of income, the extent of female education, the extent of ethno-linguistic differences, and whether a country is predominantly Muslim (Filmer and Pritchett 1999)

[7] Disease Control Priorities Project (2008) Using Evidence About "Best Buys" to Advance Global Health. Priorities were identified for groups of countries in sub-Saharan Africa and South Asia.

| | |
|---|---|
| Management of acute respiratory illness (under 5) | 28-264 |
| Cardiovascular diseases (prevention and management) | 9-304 |
| Tobacco use and addiction | 14-374 |
| Maternal and neonatal care | 127-394 |

Even when health spending is concentrated on primary health care (PHC) and effective services, governments can find it difficult to translate public spending into effective services. The large gap between the potential of technical interventions to improve health and actual outcomes is due mostly to weak health systems. Constraints to improving RMNCH outcomes include systems, processes, incentives and values or norms[8] The Timor-Leste Minister of Health recognised this need to work on all fronts at the same time in his introduction to the NHSSP:

"New ways of working are being introduced and greater emphasis is being given to quality in all the Ministry does. More efficient and effective practices are essential and many of our systems and procedures need revision, thus, seeking constant improvement in the Ministry's way of working. Further, moving health services forward requires finding alternative ways of funding, ensuring appropriate human resources, supporting improved management practices, developing a proper structure and work process, as well as maintaining the availability of advanced equipment and high technology."

> **Box 1: Is it Health System Strengthening?**
>
> • Do the interventions have cross-cutting benefits beyond a single disease?
>
> • Do the interventions address policy and organizational constraints or strengthen relationships between the building blocks?
>
> • Will the interventions produce permanent systemic impact beyond the term of the project?
>
> • Are the interventions tailored to country-specific constraints and opportunities, with clearly defined roles for country institutions?
>
> Source: Chee, Pielemeier, Lion and Connor (2013) Why differentiating between health system support and health system strengthening is needed, International Journal of Health Planning Management; 28: 85–94

Both support and strengthening of health systems are necessary, with the right balance driven by the country context. Vertical programs have been seen as a necessary evil by advocates of 'comprehensive' PHC for reasons including the low value they usually place on community participation and the fragmentation of the health system to which they are thought to contribute, leading to well-funded "empires" which overload managers and hire the best staff away from government departments. Global efforts to integrate RMNCH interventions and deliver them at

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[8] Hanson K et al. (2003). Expanding access to priority health interventions: A framework for understanding the constraints to scaling up. Journal of International Development, 15:1-14

community level have been largely successful, even as they coexist with vertical programs. The WHO Health System Strengthening framework looks across interventions and organises the health system into six main building blocks or functions. Supporting the health system can include any activity that improves services by improving efficiency or increase inputs. In contrast, an intervention can be considered to strengthen the health system only if it strategically provides benefits beyond a single disease or intervention, and has, or leads to, sustainable improvement (Box 1[9]). A focus on immediate support to providing health services can be justified in a fragile post-conflict environment, whilst identifying priority areas for strengthening over the longer term.

> **Box 2: Donor support for HSS before the current focus on health systems**
>
> The WHO/UNICEF Extended Program of Immunization developed reliable supply chains to reduce vaccine wastage. Family planning logistics and information systems developed as donors recognized the importance of continuous reliable supplies, and this area was reinforced by synergies with HIV/AIDS programs. Essential medicines have been a WHO priority since the 1979 Alma Ata (Health For All by the Year 2000) meeting. Health financing gained importance as sector reform became a development focus. Priorities for supporting health human resources have shifted but it remains an active WHO area. More recently service delivery strengthening and information systems are now supported by GFATM and GAVI. Behaviour change communication and community mobilisation (regarded by Australian aid as a seventh building block) are sometimes addressed as components of vertical projects, but strengthening leadership and governance is usually limited to specialized advice on policy and legislation.

Health System Strengthening is also a high priority globally for reaching the Millennium Development Goals (MDGs) by 2015. It was always assumed that governments would have to increase their sectoral allocations, and also a need for development donors to supplement government health budgets. Much expertise was employed in costing the health MDGs. Total annual incremental costs of meeting MDGs 4, 5, and 6 are in the vicinity of US$40 billion per year globally, or US $25- US $30 per capita. Figure 1 and Annex 3 show that nearly 80% of the total US$172 billion required until 2015 is needed for strengthening health systems, versus 20% for all disease programs. Infrastructure and human resources have the largest resource needs. The surge in spending to meet infrastructure needs would start to taper off by 2013 while spending on human resources would need to keep increasing (see also Annex 3).

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[9] G. Chee, N. Pielemeier, A. Lion and C. Connor (2013) Why differentiating between health system support and health system strengthening is needed, Int J Health Plann Mgmt 2013; 28: 85–94

**Figure 1: Incremental Costs per year for MDG 4, 5, 6. (WHO 2010)10**
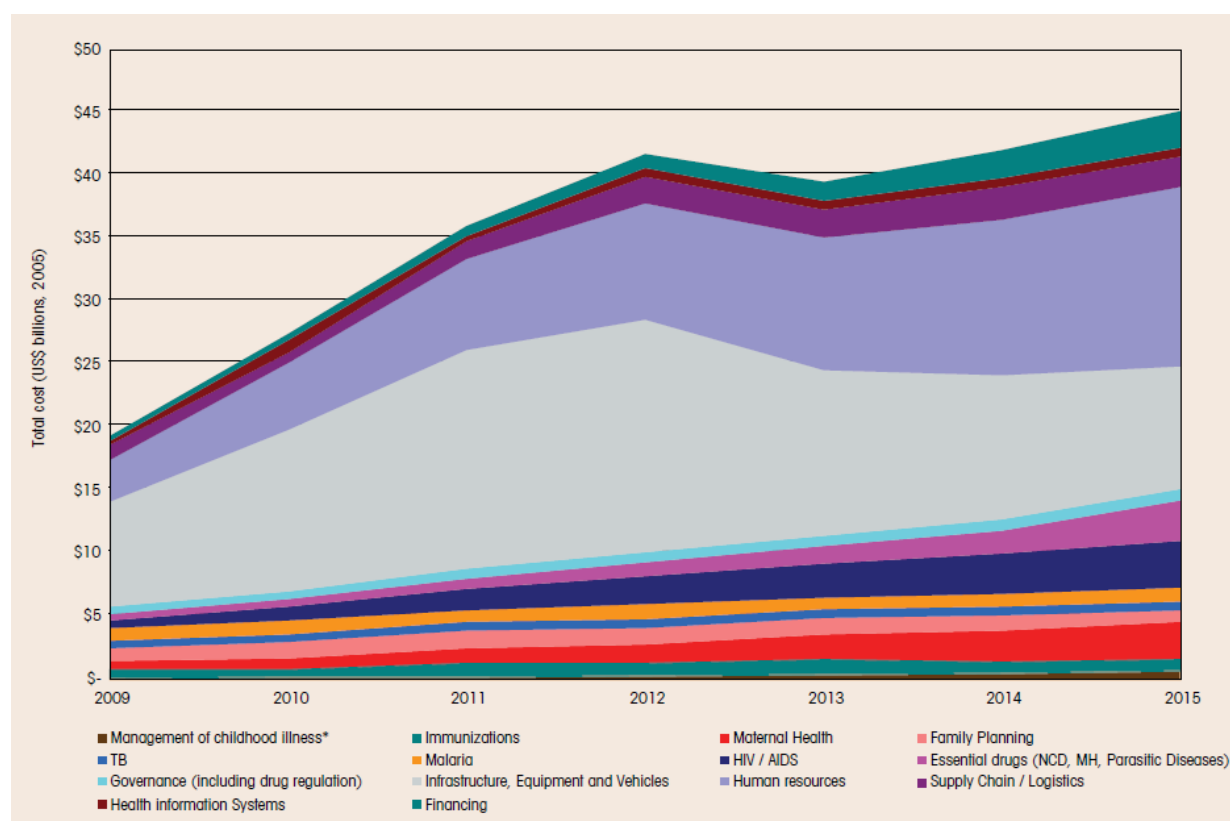


## 2.2. Priorities in designing for HSS

The WHO HSS Building Block framework is usually presented in a way which suggests that all the blocks operate in tandem to improve health system performance (Figure 2). This is certainly true when considering the entire health system, but a different dynamic determines the delivery of health services to users. At this level the building blocks are more likely represented as a chain of inputs, with the weakest link limiting how much of total resources actually is used (Figure 3). A familiar example of this is when trained health workers who are at post lack medicine and supplies. As highlighted above, the NHSSP identifies a number of weak links in the Timorese health system. Some will be easily remedied at relatively low cost while others will be more difficult and costly. The NHSSP also identifies a development time-frame as 'conditioning' (2011-2015), 'consolidation' (2016-2020), 'maturation' (2021-2025), and 'sustainable take-off' (2026-2030). The Australian aid program will carry on through only the first part of the second of these phases. Since not everything can be done at once, the project design must balance cost, time-frame, relative importance, and likelihood of achieving the needed short-term and long-term impacts in selecting priority activities.

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[10] Constraints to Scaling Up the Health Millennium Development Goals: Costing and Financial Gap Analysis Background Document for the Taskforce on Innovative International Financing for Health Systems Working Group 1: Constraints to Scaling Up and Costs, WHO 2010

**Figure 2: WHO System Building Blocks**
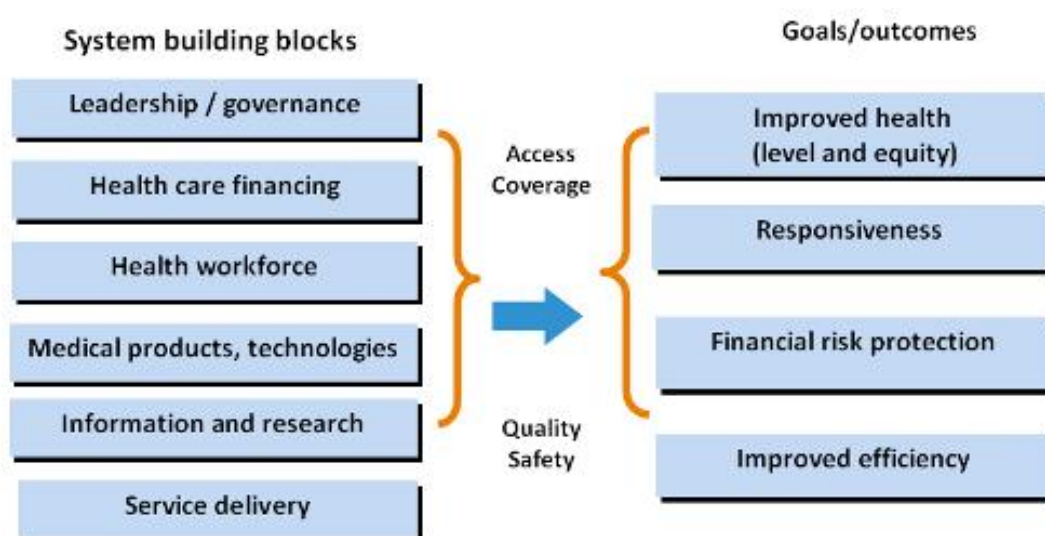


**Figure 3: Service delivery building blocks operate in a chain**
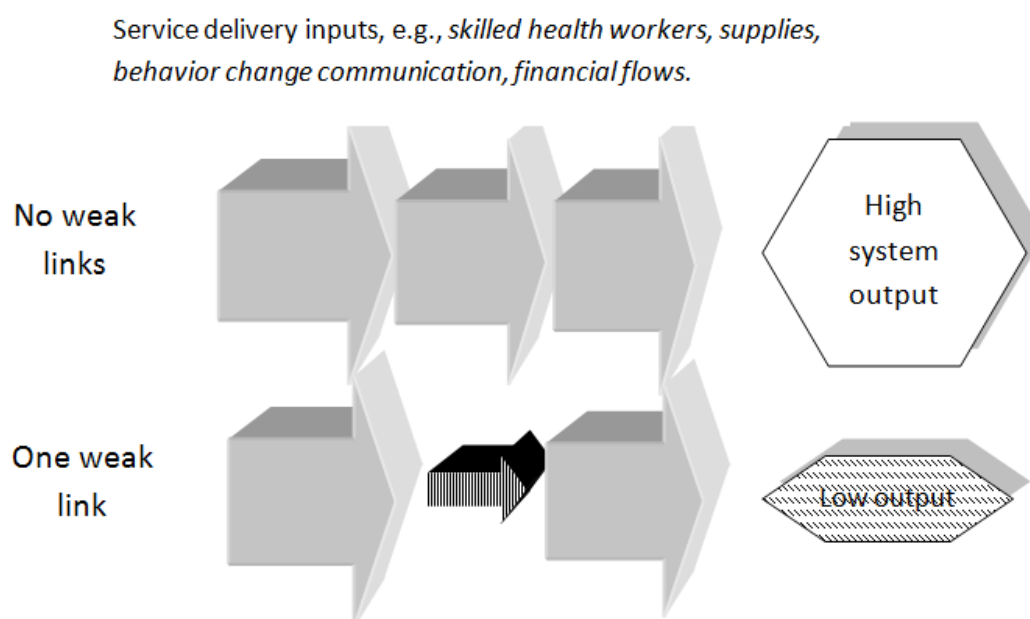


Designing a HSS project can be a 4-step process:

1. assessing the present state of the systems under consideration and what specifically could be done to strengthen them and remove bottlenecks
2. designing a range of effective programs and activities that target specific weak areas
3. estimating the resources needed from the host government and the donor agency to carry out the program
4. assessing the relative strengths and weaknesses of activities and their likelihood of succeeding.

Literature on health systems strengthening consists of a large number of "toolkits" for assessing health systems and identifying weak links, guides to costing the activities, and "dashboards" to monitor improvement progress. Most of these have been prepared by, or for, development partners who have large stakes in assuring that their tangible inputs are accounted for and not wasted.

The scale and therefore the costs of HSS interventions can range from an individual advisor working with a counterpart, to the small industry that employs hundreds of specialists in supply-chain management for HIV/AIDS and family planning programs. Guidelines for costing systems interventions are available, such as Johns et al[11]. Country-specific costs are rarely mentioned because toolkits are intended to be universally applicable. What is sorely lacking (with the possible exception of the field of supply management[12]) is the kind of documentation and systematic review of actual experience that exists for technical interventions and could provide evidence for prioritising inputs and activities, especially indicators that relate inputs and outputs and case studies of individual HSS experiences. Evaluations usually cannot include complex studies that would establish links between activities and health outcomes, and it is entirely possible that an HSS program contributes only to strengthening specific aspects of the health system, without any direct linkage to health outcomes[13]. While technical interventions have evidence-based cost-effectiveness and can be compared in terms of DALYs (or the equivalent[14]), this is not possible for health system interventions due to lack of robust available data.

## 2.3. Using benefits of technical interventions to evaluate health system support interventions

Governments and development partners usually have an idea of what support is needed, but lack evidence on which to base assumptions of effectiveness of HSS interventions. The following section discusses proposed Australian aid program activities within this context of a lack of data.

For the new Australian aid health program, the output is the prevention of avoidable maternal, neonatal, and child deaths and the strategy is to provide support for health sector development. The proposed support package (Annex 2) is not yet well defined but the first objective is clear – to accelerate the population's access to basic healthcare by establishing functioning, fully staffed Health Posts in each suco by 2017. The second, to support institutional development, could include any of a wide range of inputs; nothing has been ruled out but phasing of engagement will be guided by MoH prioritisation and global experience and best practice.

More than a third of East Timor's population lives more than two hours walk from health facilities[15]. The proportion of skilled attendance at birth is only 30%, and

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[11] Johns, B., Baltussen, R. and Hutubessy, R. (2003) Programmme costs in the economic evaluation of health interventions. Cost effectiveness and Resource Allocation, 1:1

[12] USAID's DELIVER and Health Systems 20/20 projects cover many countries, and USAID funds several country initiatives. GAVI and GFATM fund country HSS activities within other programs.

[13] K. Itamar, G. Chee, A. Hulme and S. Koseki. (2012). Framework and Guideline for the Assessment and Evaluation of Health Systems Strengthening Program. Bethesda, MD: Health Systems 20/20 project, Abt Associates Inc

[14] Benefit-cost analysis has been used in the past, but the 'human capital' approach that places a monetary value on loss of functional life is no longer considered useful, valid or ethical.

[15] MOH 2007 Basic Services Package

antenatal coverage (four visits) is only 55%. These indicators are reflected in the high rates of maternal, neonatal, and under-five mortality[16]. It is in this context that a package of interventions will be agreed upon by the Australian aid program and the MoH.

A recent model makes it easier to estimate the potential impact of different RMNCH interventions, or of packages of interventions targeted at different levels of the health system[17]. The model begins with the numbers of deaths due to the main causes of maternal, neonatal, and child mortality, then uses a 'disability multiplier' based on international literature to estimate the number of surviving but disabled women or children, by cause. The percentage of each of the main causes of mortality that could be treated at three levels of the health services was estimated based on international data which assumes performance of a functional health system. With this data it is possible to calculate the total numbers of avoidable premature death and disability and attribute potential benefits to various types of interventions and the level of service (community, health centre, or referral). Tables 2 and 3 show the 'global' evidence-based assumptions used. These are approximately the same as will be provided in Timor-Leste's basic service package (BSP).[18]

**Table 2: Intervention Packages by Level**[19]

| Category | Interventions |
| --- | --- |
| Core Package: community level | Antenatal care (ANC), Skilled birth attendance, Basic family planning, Essential newborn care, Promotion of exclusive breastfeeding, Immunization, Vitamin A supplementation, Oral Rehydration, IMCI, Hygiene, Bed nets<br>Enhanced: + antibiotic, + misoprostol |
| Expanded Package: health center level | All the above plus complementary and therapeutic feeding, zinc supplementation, new vaccines, long-term family planning methods<br>Enhanced: + intravenous magnesium sulfate + MVE capacity |
| Comprehensive Package: district hospital level | All the above plus emergency obstetric and neonatal care, antiretrovirals for HIV and PMTCT, water and sanitation |

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[16] A model of emergency obstetric and newborn care identifies the 'three delays' The delays in deciding to seek care and in reaching appropriate care relate to the issue of access to care, encompassing factors in the family and the community, including transportation. The third delay, in receiving care, relates to factors in the health facility including quality of care. In practice, it is crucial to address the third delay first, for it would be useless to facilitate access to a health facility if it was not available, well-staffed, well-equipped and providing good quality care (UNFPA website on EmOC).

[17] S. Foster and M. Bryant (2013) A Framework for Estimating Benefits of Investing in Maternal, Newborn, and Child Health. Partnership for Maternal, Newborn and Child Health, Geneva

[18] This may not be the case at present. The NHSSP observes: "…although the mission is to provide comprehensive family care, the relationship between primary, secondary, and tertiary care does not always support this mission. There are very few guidelines and agreed protocols for referral between primary, secondary and tertiary care."

[19] S. Foster and M. Bryant (2013) These are not specific to any one country.

**Table 3: Disability multipliers and level that condition could be treated**[20]

| | Disability Multiplier | % of condition which could be treated at level: | | |
|---|---|---|---|---|
| | | Community | Health Center | Hospital |
| **Maternal**: | | | | |
| PPH | 2 | 30% | 75% | 90% |
| Sepsis | 1 | 40% | 70% | 95% |
| Obstructed labor | 20 | 0% | 25% | 95% |
| Hypertension | 1 | 0% | 60% | 90% |
| Unsafe abortion | 10 | 0% | 50% | 85% |
| Embolism | 0.25 | 0% | 0% | 5% |
| Other direct | 1 | 25% | 25% | 90% |
| Indirect causes | 1 | 50% | 50% | 50% |
| **Newborn:** | | | | |
| Asphyxia | 8 | 75% | 95% | 95% |
| Infection | 1 | 75% | 75% | 95% |
| Congenital | 10 | 0% | 0% | 25% |
| Preterm | 8 | 40% | 50% | 60% |
| Diarrhoea | 0 | 80% | 95% | 95% |
| Tetanus | 0 | 0% | 0% | 10% |
| Other | 1 | 25% | 50% | 50% |
| **Child**: | | | | |
| Pneumonia | 0 | 75% | 95% | 95% |
| Other | 0.25 | 25% | 50% | 75% |
| Diarrhoea | 0 | 80% | 90% | 95% |
| Malaria | 0.25 | 40% | 75% | 90% |
| Injury | 2 | 25% | 50% | 75% |
| Meningitis | 1 | 0% | 0% | 75% |
| AIDS | 0.5 | 25% | 60% | 90% |

Total annual deaths and disabilities and potential health system response calculated for Timor-Leste are shown in Table 4 against the three levels of intervention package. The Table therefore identifies the possible additional deaths and disability averted as a package of interventions becomes increasingly comprehensive. Neonatal disabilities are by far the highest number, followed by child deaths and maternal deaths. Unsurprisingly, as the package becomes more comprehensive, an increasing number of deaths and disability are averted. (The figures represent cases, not DALYs).

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[20] S. Foster and M. Bryant (2013)

**Table 4: Maximum benefits from NMCH interventions in Timor-Leste[21]**

| | Health System Response - Maximum Deaths and Disabilities Averted by level[22] | | | | | |
|---|---|---|---|---|---|---|
| | Maternal | | Neonatal | | Child | |
| Actual | 131 | 418 | 1062 | 5339 | 2365 | 651 |
| Package and level of service | deaths | disabilities (all types) | deaths | disabilities (all types) | deaths | disabilities (all types) |
| Basic | 18 | 57 | 561 | 2824 | 995 | 274 |
| Expanded | 66 | 209 | 687 | 3456 | 1601 | 411 |
| Comprehensive | 114 | 418 | 780 | 3922 | 2029 | 559 |
| Ratio of disabilities to deaths | 3.17 | | 5.03 | | 0.27 | |
| Averted if service level is fully effective | 86.9% | | 73.5% | | 85.8% | |

The percentage of deaths and disabilities averted shown above as the health system response would be the theoretical outputs achievable by a strong health system[23]. If the Comprehensive level (roughly equivalent to Timor-Leste's basic service package) reduced the maternal mortality rate (MMR) by 87%, the neonatal mortality rate (NNMR) by 73%, and the child mortality rate (CMR) by 86%, Timor-Leste would in the same class as many industrialised countries. The actual numbers of lives and disability currently averted is closely related to actual health system effectiveness. In recent years the rate of improvement in the main indicators has been less than 5 per cent a year. This average annual rate of decline (AARD) is typical among low-middle income countries[24]. According to the models of health system constraints discussed earlier, this implies health systems that have made the maximum possible improvements in health status are either not getting the resources they need, and/or the system does not efficiently convert resources into health outcomes. Current health district-level financing in Timor-Leste (discussed under Question 4) is close to the US$28 per capita normative cost of the BSP including referral hospitals[25], so if the present rate of reduction in key health MDG indicators is only 5% rather the theoretical ≈80% achievable with a comprehensive package of services (73.5% to

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[21] Adapted from: S. Foster and M. Bryant (2013)

[22] Based on 2011 UNICEF data:(Pop.1.154 million, Crude Birth Rate = 38, Adjusted maternal mortality rate = 300, chjld mortality rate = 54, neonatal mortality rate = 24), Disabilities are calculated using the global multipliers from Foster et al (2013)

[23] Foster et al carry the analysis further by estimating the cost of lost productivity based on years of life lost between life expectancy and average age at death due to each health condition, and loss of income caused by disability. If this human capital approach were used in the example shown for Timor-Leste and a year of premature loss of life valued at $3,670 (GDP/capita) and a year of disability over a 5-year time horizon valued at half that, the total of $137 million per year would represent a loss of aggregate household income equal to 10.5% of GDP ($1,293 million in 2012).

[24] WHO (2013) World Health Statistics 2013

[25] T. Ensor, H. Firdaus & T. Lievens (2010) Health facilities costing in Timor-Leste Final Report, Oxford Policy Management

86.9% seen in Table 4), the current level of health system efficiency in converting resources to potential outputs could be considered to be the ratio, 5/80 or 6.25%.

## 2.4. Health system interventions map onto RMNCH benefits

Table 4 shows the maximum benefits obtainable if the health system performed optimally, and the marginal benefits of treating cases with an adequate service package at increasingly higher levels, where there is a better chance of preventing death and disability. The benefit from providing a specific individual resource or health system intervention is more difficult to estimate. Using ambulance repair as an example can illustrate how benefits can be related to a specific activity.

## 2.5. Health transport analysis

Population dispersal and the condition of transport infrastructure have large influences on the cost and effectiveness of service delivery. Excluding cases where the illness was not considered serious enough, the overwhelming reason why sick persons do not seek treatment in Timor Leste is that health facilities are too difficult to access[26]. Although the density of the road network in Timor-Leste is relatively high compared to some other low and middle income countries with reasonably good penetration that make villages an average of 0.7 km from a vehicle-passable road, access to health facilities is difficult from poor villages that are the furthest from paved roads. Rural road improvements that improve access to markets and services are seen as a modality for poverty reduction, although this is disputed[27]. Increasing the number of community health centers and other outreach services is an alternative, but the economic advantages over road and transport improvement has not been carefully studied in Timor-Leste or elsewhere[28]. Poor roads are also costly to vehicles, as shown by most of the disabled ambulances needing new suspension components[29].

MoH ambulances are based at the National Hospital or at district referral hospitals, but it is reported that 84% of emergency calls are not responded to[30], in part because 10 of the 44 ambulance/multipurpose vehicles in the country are currently inoperable. The extent to which vehicles are used for personal transport rather than intended use has not been documented. Management of fuel supplies was identified as a problem of financial management[31] but is no longer considered to be a problem[32].

Most of the assumed newer ambulances appear to be of Korean or Chinese manufacture, whilst most of the inoperable ones are Toyota Land Cruisers and Nissan Patrols that were probably supplied by previous projects. Currently all GoTL ambulances are repaired by contracted workshops in Dili, one for hospital

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[26] Rannan-Eliya, R. P., R. Hafez, C. Anuranga and R. Wickramasinghe (2012) The Impact of Out-of-Pocket Expenditures on Families and Barriers to Use of Maternal and Child Health Services in Timor-Leste: Evidence from the Timor-Leste Surveys of Living Standards 2001 and 2007 Manila: ADB

[27] www.ruralroads.org

[28] Australian aid has provided inputs for rural road improvements to improve access to health and other services.

[29] Direção Nacional Apoio Serviço Hospitalares 2013(?) Dadus Ambulancia Ba Reparasaun

[30] Australian aid Dili health staff

[31] K. Whimp (2010) Report on Bottlenecks in Service Delivery

[32] Australian aid Dili health staff

ambulances and the other for multipurpose and general vehicles[33]. This apparently precludes using any repair shops in rural areas, so the planned mobile team would mainly repair vehicles which cannot be moved to Dili. A mobile repair van would be limited to simple repairs such as brakes, tyres, and replacing batteries and minor parts. The proposed initial assessment of needed repairs and the design of a longer-term sustainable project will require professional expertise to be provided by Australian aid's procurement and logistics contractor Charles Kendall Group. Ad hoc vehicle repair by a mobile mechanic team could be the foundation of health system strengthening, and options for longer-term solutions will need to be explored.

In the short term, a vehicle repair activity increases the value of a broken ambulance from near zero to the cost of a similar vehicle. An intermediate-term value can be placed on having a system of regular preventive maintenance that will extend the useful life of a large number of vehicles. The long-term value can be related to an improvement in overall health system performance that reduces avoidable deaths and disabilities. Using the results of the health system response analysis (Table 4), if maternal emergencies are treated at hospital rather than in the community the increased survival rate would represent the benefit obtained from equipping and staffing a hospital with staff and resources to deal with these cases and removing barriers to access. This would amount to (114-18) = 96 maternal deaths and 306 maternal disabilities per year.

This provides an illustration of how overall system outcomes can be used to isolate the value of a system support intervention. In an (unrealistic) scenario, the hospitals are otherwise fully resourced, operate efficiently and provide all emergency services except for transportation from community level. A loss of all 96 mother's lives and 306 disabilities could then be attributed to lack of emergency transport. (Similar estimates can be made for the case of transportation between Health Centre level and referral hospital, or community to health centre). If 26 ambulances (two per district) were needed to handle all emergency transportation, the benefit per ambulance (and therefore the cost per non-operational vehicle), would be about 3.7 maternal deaths and 11.7 maternal disabilities per year. (These numbers could be converted to DALYs if detailed data existed about the disabilities.)

The benefits increase considerably if ambulances are also used for neonatal and child emergencies. The benefits under the (unrealistic) full efficiency scenario comprise 219 neonatal deaths and 1098 disabilities, and 1034 child deaths and 285 disabilities. Again assuming the lack of ambulance transport from community to hospital is the only reason for these avoidable deaths and disabilities yields an additional benefit per working ambulance of 1253/26 = 48.2 deaths and 1383/26 = 53.2 disabilities per year. There are other, perhaps equally or more important, health system reasons for the avoidable deaths, but even if lack of emergency transport was the immediate cause of only a small fraction, vehicle repair and maintenance can still be considered an excellent investment both in the short term and the long term. (The cost of a new ambulance can vary between US$20 000 and US$60 000; repairs to vehicles that are disabled for causes mentioned in a recent MoH survey would likely cost between US$100 and US$2000 in direct costs of parts and labour).

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[33] Australian aid Dili health staff

If the relative influence of every system bottleneck could be estimated, a more realistic estimate of benefits could be made for each weak link that is strengthened. For example, if all "three delays" in emergency obstetric and newborn care (EmONC) are estimated to be equally critical, then one-third of maternal deaths and disabilities would be attributed to each. Or, if emergency transport (generally, access) and each of the following five system building blocks are estimated to be equally critical links, then one-sixth of the total number of deaths and disabilities could be attributed to each. This is still very hypothetical but may provide decision-makers with a rough idea of the benefits to be had from successful system interventions.

## 2.6. Health infrastructure and equipment

The government allocated a total of US$3.1 million for medical equipment for district health services in the 2013 budget. There was no special budget for maintenance and repair of medical equipment, or for equipment at district level in 2011 or 2012. Longer-term system strengthening should include creating a mechanism to conduct regular surveys of facility equipment, complemented with revised budgeting procedures that include funding for equipment maintenance and replacement.

Providing surgical equipment and skilled staff to address emergency obstetric care (EmOC) would bring benefits beyond maternal health, by providing the ability to care for victims of trauma such as road traffic accidents, falls, and burns, and other surgical emergencies such as appendicitis, hernia, and other surgical conditions. It is a highly cost-effective intervention in virtually all settings[34].

To significantly improve the availability, distribution and condition of appropriate essential infrastructure and equipment and improve equity of access to essential health services will require a database system, establishing standards, an infrastructure development plan, a capital fund, and capacity building in development and maintenance of all infrastructure and equipment. The Consultant managed a hospital equipment maintenance project in a medium-income country some time ago. Most repairs to sophisticated equipment were done by manufacturer's representatives, so project activities mostly involved basic on-site electrical and plumbing repairs including generators and medical gases and kitchen and laundry equipment. A mobile van with some basic tools was provided but not used very much since most hospitals had similarly-equipped workshops. A central workshop may not be needed but trained technicians are, as well as means of transport.

## 2.7. Human resources for health

Between 3000 and 3500 of the estimated workers in the health sector in Timor-Leste are civil servants in MoH institutions and units. Half do not have medical or health skills. Of the total of US$22.47 million in salary and wages in 2013, 62.1% was spent on district health services and 25.8% on hospitals, of which half was for the national hospital[35]. The number of health workers employed in the private sector remains

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[34] S. Foster and M. Bryant (2013) A Framework for Estimating Benefits of Investing in Maternal , Newborn, and Child Health. Partnership for Maternal, Newborn and Child Health, Geneva
[35] D. Northway HRF March 2013 East Timor Budget Analysis

undocumented[36]. Health workforce development is a major priority of the government. Labour markets and state action play key roles in both the short and long term, prepare the workforce through strategic investments in education, enhancing workforce quality and performance through in-service training and good management, and finally by managing migration and attrition to reduce wasteful loss of human resources.

Only 50% of births are currently attended by skilled personnel, although the NHSSP points out that rapid progress is being made on this. Caesarean deliveries are only 2% of the total. Unmet need for family planning is 32% and contraceptive prevalence only 22%[37] . Other indicators of maternal, infant and child care are low-to-middling. The MoH recognises the critical shortage of nurses and midwives and is taking measures to significantly increase the number of health workers, particularly in rural areas. Challenges include retention of health workers in rural areas, sufficient supervision and management for health workers to perform to their maximal capacity, sufficient medical equipment and supplies for them to perform their jobs, and the need for additional clinical and management training.  The Government Plan is to allocate one medical doctor, two nurses, two midwifes and one lab technician to health posts in every village with population of 1500-2000. The Cuban Medical Brigade constitutes a major component of the clinical workforce, providing two of every three doctors in Timor-Leste. By 2015 about 900 students from Timor-Leste will have studied medicine in Cuba [38]. Managing their return, funding and deployment will present a major management challenge. A new human resources policy will increase the pay of health professionals with appropriate qualifications.

The current low rate of skilled assistance at deliveries can be in part attributed to a shortage of nurses and midwives. The shortage of midwives is estimated to be 462, nearly the same number as currently serving. Around 460 new nurses will be needed at district and subdistrict level. These gaps are planned to be filled by 2017, corresponding to a recruitment of approximately 115 of each per year for four years[39]. It is not known if Timor salary levels are a sufficient inducement for Indonesian nurses and midwives to come. If midwives and nurses are recruited from Indonesia, in addition to assuring their salaries are paid regularly they will need medical supplies, living quarters, transportation, etc. to deliver services.  Most of the current nurses and midwives were trained in Indonesian nursing and midwifery schools, and some are now being trained by the MoH at the National University of Timor-Leste (UNTL) as well[40].  It is not known if the standard training at UNTL is the same as in Indonesia. UNTL nursing and midwifery students are fresh graduates from Senior Secondary school whereas the Indonesia model is to train Junior Secondary graduates for 3 years to become nurses, and they can continue for a 1-year diploma in midwifery.

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[36] Asante, A et al. (2011)  A review of health leadership and management capacity in Timor-Leste, Human Resources for Health Knowledge Hub, University of New South Wales, Sydney

[37] WHO Country Cooperation Strategy  2013 Timor-Leste

[38] Australian aid Dili Health Staff

[39] Exactly the same cost-effectiveness analysis could be made for missing skilled staff as was done for broken ambulances. However in order to compare different interventions, the assumption of *ceteris paribus* would have to be replaced by assumptions about relative importance, e.g., not having ambulance transport is X times as important as not having a nurse at a health centre. .

[40] Australian aid Dili Health Staff

The above measures should be effective in the short and medium-term in improving access to and quality of services. Long-term planning for adequate human resources requires allocating a permanent training budget, creating a periodic procedure for conducting skills assessments, establishing mechanisms to regularly review training curricula, and creating institutional capacity to conduct training on a regular ongoing basis, as well as developing a trained management cadre for health human resources. A comprehensive workforce plan detailing current staffing gaps, training opportunities and recruitments as per health facility and service levels will be developed, given priorities to the district health services. Strategies for Human Resources Management will include performance based incentive schemes linking reward and promotion to workload, performance and results.

## 2.8. Leadership and Governance

The NHSSP proposes a major agenda to improve health sector leadership and governance, recognising its critical importance in meeting health objectives. The areas identified for strengthening are policy and regulation, health system responsiveness and accountability, and inter-sectoral collaboration.

The tasks described in the NHSSP for implementing and monitoring the development of the national health system are enormous in scope and number. Success will depend on effective leadership and day-to-day management of the Ministry of Health. Given the large number of activities and assistance projects that the MoH needs to manage, both the number and skills of (especially) mid-level managers probably needs to increase.

There were about 50 senior managers/directors and 130 middle-management personnel working in the Timor-Leste health system as of November 2007. Top MoH management is well qualified (the Minister and Vice Minister are medical doctors and one Vice minister, a Director-General and 4 of 5 national directors have public health training), but a recent report summarises managerial competence at the district level as being low[41]. Each of the 13 districts has a health management team headed by the district Director of Health Services. Most district health managers perform dual roles as both nurses and managers, conducting a clinical role while also performing management and administrative functions, but the majority has no formal qualification in management or a related discipline.

WHO has facilitated management training of health personnel and multiple donors provide or support short courses in management, and in-service training in community health centre management and leadership by the Timorese Institute of Health Services, but the impact of such training on management performance is largely unknown.

New district health managers receive little supportive supervision from their more experienced colleagues at higher levels. Key management support systems do not function adequately in support of managers. Supply of essential drugs and materials can be erratic, compromising the effectiveness of managers. Through the NHSSP Support Project, Australian aid currently supports health leadership and management

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[41] Asante, A et al. (2011) A review of health leadership and management capacity in Timor-Leste, Human Resources for Health Knowledge Hub, University of New South Wales, Sydney

training for district Directors, with modules on management of health resources at the district level, leadership, management and partnership in health, and planning and implementation of health services. In the future, the Ministry aims to train all managers both at central and district and sub-district level[42].

Sector coordination is an ongoing challenge[43]. The State Budget Book #5 lists 22 health projects funded by development partners in 2014 for a total of US$32.8 million in the health sector, including water and sanitation projects. At least ten different UN, multilateral, and bilateral donor agencies are funders or implementers. There have been attempts to move away from the model of a dedicated Project Implementation Unit to a more integrated and mainstreamed approach to managing projects but the pace of implementation has been limited by the shortage of institutional and implementation capacity within the MoH[44]. The new Australian aid program envisions a capacity-building, mentoring model that intends going no faster than the speed of government and taking an incremental approach to addressing critical challenges.

There are no "toolkits" to help break through the extreme constraints on health system effectiveness that improved management and coordination would help to reduce. Any solutions are likely to be specific and ad hoc, but the Consultant worked on a short project in The Gambia in 1995 that was propelled by impressive coordinated support from the MoH. At that time DfID (UK) was sponsoring MoH staff for masters-level training in health planning and management, all at Nuffield Centre at Leeds University. By 1995, enough senior and mid-level staff had returned to the small health ministry to form a critical mass of leaders who were "on the same page" about how to advance public health, and were making rapid progress improving the management of the health system. This is of course an expensive way to train people, but perhaps returns benefits that in-country training cannot. Language is a barrier for Timor-Leste, but appropriate training courses in Portuguese-speaking countries or in Indonesia could provide the quality (and prestige) valued by participants and donors.

## 2.9. Demand creation, community mobilisation, and behaviour change communications (BCC)

Low utilisation of health services and high maternal mortality are associated with low female literacy in many developing countries. Improvements are inherently slow to achieve in education, so BCC for health can be a critical substitute.  It is understood that there have been several projects to improve BCC in Timor-Leste related to HIV/AIDS prevention. Indonesia has also had many, going back to the early 1990's[45], but online searches for documentation found none. The Timor Leste Demographic and Health Survey (TLDHS) gathered information about knowledge, attitudes and practices related to HIV/AIDS, and also knowledge of birth spacing methods. The latter suggested a large gap between knowledge and practice. It would be useful to know if there have been any studies that would help understand this gap, and

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[42] Australian aid Dili Health Staff

[43] Australian aid Dili Health Staff

[44] Health Alliance International (2008) Improving Maternal and Newborn Health in Timor Leste Final Evaluation Report: Seven Districts in the Democratic Republic of Timor-Leste December

[45] Ken Swann, BCC consultant, personal communication.

especially the low utilisation of health facilities, and in general to prioritise objectives for behaviour change. The NHSSP mentions the need to develop the national plan for health promotion but does not go into detail. Support in this area should focus on RMNCH , especially in ways that will increase the use of antenatal care and assisted delivery.

## 2.10. Medicines and consumables

Medicines and consumable medical supplies are procured and managed by Servico Autonomo de Medicamentos e Equipamentos de Saude (SAMES), now a semi-autonomous MoH unit. A 2011 study of management of the pharmaceutical sector recommended giving SAMES autonomy as a commercial entity under government control[46]. A recent situation analysis of the pharmaceutical situation with a focus on health care delivery and use of medicines found that the management of drug supplies was weak in several areas. Regulation, guidelines for drug use, and management tools were under-developed, and the management system at district level was especially deficient. No specific short-term needs for more drugs or equipment were identified, but several organisational changes were suggested including better coordination between the Department of Pharmacy and SAMES[47] . The new project could continue to provide technical assistance and other inputs to aid the SAMES transition and organisational changes. In addition many guides and 'toolkits' for supply management are available.

To summarise the foregoing, health systems strengthening is necessary to meet RMNCH health targets in most countries, and far more time and resources will be needed to develop health systems than for technical interventions. At the service delivery level, overall performance improvements may require addressing all weak links at the same time. The new health program appropriately emphasises system support activities, but lack of global evidence on the effectiveness of HSS interventions, and the lack of specific information about the situation in Timor-Leste (exceptions being the gaps in ambulance service and key RMNCH human resources) makes it difficult to prospectively evaluate the proposed Project interventions.  It is important, however, to assure that short-term interventions are followed by activities to permanently strengthen the related part of the system. The steps needed in some of these areas are clear, but in others, including leadership and governance and BCC, an approach to long-term strengthening should be studied carefully before proposing activities.

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[46] A. Seiter (2011) Options for Improving Governance and Management in the Pharmaceutical Sector The World Bank

[47] K. Holloway (2012) Timor-Leste Pharmaceuticals in Health Care Delivery Mission Report

## 3. How efficient is current government allocation and expenditure for health? How could government better use the US$60 per capita spent to improve maternal and child health outcomes, and how is it currently spent?

This question is answered by examining several efficiency criteria and by comparing Timor-Leste with other countries. Some of these analyses have been done in previous studies which are updated here. Better data on health spending including donor sources, equity, and the private sector will become available when National Health Accounts are established. This new activity will provide information in a format that can be more easily compared to other countries.

### 3.1. How is Timor-Leste performing compared to similar countries?

A 2011 World Bank Health Financing Note compared Timor-Leste with other groups of countries (island, post-conflict, similar income levels) and concluded that performance is mediocre in measles immunisation, TB incidence, and TB detection, and average with respect to infant mortality. For maternal mortality, several countries that spend considerably less on health than Timor-Leste have similar maternal mortality rates. A recent study suggests that health spending and life expectancy in 'fragile states' in the Asia-Pacific region (Timor-Leste and Papua New Guinea) is close to that in the low- income countries but considerably less than the region's middle-income countries (Table 5).

**Table 5: Comparisons of health expenditures in Asia-Pacific countries[48],[49]**

|  | GDP/capita, $, 2011 | Health spend/capita, $, 2011 | Life expectancy, years |
|---|---|---|---|
| Indonesia (MIC) | 3,495 | 95 | 70 |
| MICs average | 3,378 | 172 | 72 |
| Cambodia (LIC) | 897 | 51 | 63 |
| LICs average | 1,113 | 47 | 68 |
| PNG (Fragile state) | 1,845 | 79 | 64 |
| Fragile states[i] average | 1,371 | 63 | 64 |
| Fiji (SIS) | 4,397 | 168 | 70 |
| SIS average | 3,098 | 509 | 71 |
| All countries in study | 2,633 | 272 | 67 |
| **Timor-Leste\*** | **896** | **34** | **63** |

Figure 5 shows countries with similar levels of Government Health Expenditure (GHE) per capita to Timor-Leste, ten immediately above and ten below, compared with their health indicators. Timor-Leste (large size data points) outperformed

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[48] Whitaker, D., Walford, V. and David, B. (2013). Health care financing in the Asia Pacific region, HLSP Institute;
\* data from authors of Whitaker et al (2012) not shown in the paper Health care financing in the Asia Pacific region. Original data on GDP/capita from World Bank website, data on health spend/capita from WHO's National Health Accounts database and data on life expectancy from UNFPA (2012) State of the world's children 2012
[49] Middle income countries (MICs): China, Mongolia, Philippines, Vietnam, Bhutan, India, Indonesia, Maldives, Sri Lanka, Thailand; Low income countries (LICs): Cambodia, Laos, Bangladesh, DPR Korea, Myanmar, Nepal ; Fragile states: Papua New Guinea, Timor Leste; Small island states: Cook Islands, Fiji, Kiribati, Marshall Islands, Micronesia, Nauru, Niue, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu

comparable spenders for CMR, and is almost at the expected level for IMR[50].  If only government health expenditures were driving health outcomes, the steep trendlines imply that the increases in the Timor-Leste GHE in recent years should have produced significant falls in these indicators[51]. The econometric model mentioned in the previous section supports a different interpretation however, that the better outcomes shown result  primarily from higher national incomes in those countries, which produce health improvements independent of government spending on health (such as better housing and nutrition), but also drive public health expenditures to higher levels[52].

**Figure 4: Health indicators vs. Government Health Expenditure per capita[53]**
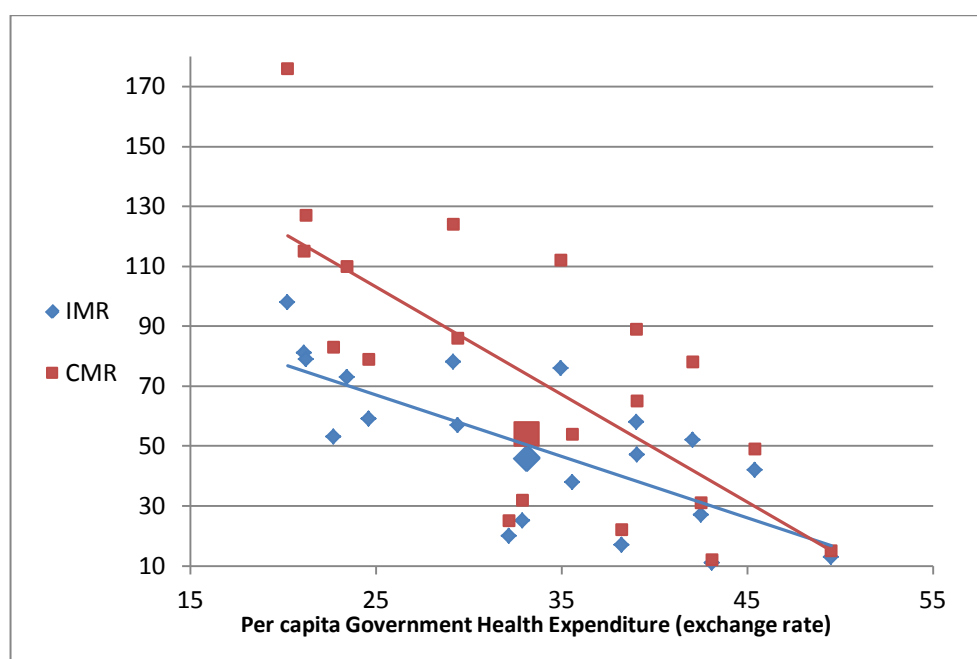


GHE per capita (US$): Mali 20, Côte d'Ivoire 21, Cameroon 21, Malawi 23, Togo 23, Comoros 25, Nigeria 29, Sudan 29, Philippines 32, Indonesia 33, Timor-Leste 33, Mauritania 35, Rwanda 36, Viet Nam 38, Sao Tome and Principe 39, Senegal 39, Ghana 42, Kyrgyzstan 43, Sri Lanka 43, Uzbekistan 45, Syrian Arab Republic 50.

## 3.2. Health expenditures in Timor-Leste

Table 6 updates the World Bank Health Financing Note (2011) with recent WHO data. In addition to extending the series by three years, there are changes to several data points prior to 2009, suggesting the earlier dataset contained errors.

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[50]The data points indicating better performance for the same level of GHE represent Indonesia and the Philippines, and the ones with much better performance are Vietnam and Sri Lanka, all countries with mature health systems and/or high emphasis on PHC.

[51] No corresponding analysis was made for maternal mortality, which might have a lower response to government expenditures because female literacy may be as important a factor as availability of skilled birth attendants.

[52] This relationship is well-founded in cross-national data. Literacy (a significant factor identified by Filmer 1999) is also higher among the higher-spending countries in this particular group. There is no *a priori* reason that a country that spends more also does it more efficiently, so health system efficiency should have a random effect.

[53] WHO (2013) Health Statistics 2013

**Table 6: Revised Timor-Leste historical health expenditures 2000-2011 [54]**

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total expenditure on health (THE) as % of GDP | 8.0 | 10.3 | 9.7 | 10.2 | 11.0 | 10.2 | 11.7 | 10.1 | 8.6 | 6.9 | 5.7 | 4.9 |
| External resources for health as % of THE | 58.6 | 57.2 | 50.4 | 14.8 | 23.2 | 22.8 | 25.1 | 38.2 | 31.3 | 47.1 | 42.8 | 50.8 |
| General government expenditure on health as % of THE | 78.9 | 75.8 | 78.7 | 79.8 | 80.8 | 86.0 | 88.1 | 86.3 | 83.6 | 78.9 | 74.7 | 71.5 |
| Private expenditure on health as % of THE | 21.1 | 24.2 | 21.3 | 20.2 | 19.2 | 14.0 | 11.9 | 13.7 | 16.4 | 21.1 | 25.3 | 28.5 |
| Per capita THE at average exchange rate (US$) | 30 | 34 | 31 | 33 | 35 | 46 | 50 | 50 | 53 | 49 | 45 | 46 |
| Per capita GHE at average exchange rate (US$) | 24 | 26 | 24 | 26 | 28 | 39 | 44 | 43 | 44 | 39 | 33 | 33 |
| Per capita GHE, constant (2013) US$ *ppp 2000=$65, 2010=$63 (WHO)* | **33** | 34 | 31 | 33 | 35 | 47 | 51 | 48 | 46 | 42 | 35 | 34 |
| *Government expenditure on health as % of total government expenditure* | *12.7* | *42.4* | *41.2* | *35.5* | *35.5* | *38.3* | *23.5* | *19.3* | *9.9* | *7.1* | *5.0* | *2.9* |

The spike in Total Health Expenditures (THE) as per cent of GDP (to 16.4% in 2006) that was seen previously has vanished, and this indicator shows a sharply decreasing trend that is due in part to rapidly rising GDP. The rising trend in (absolute) GHE appears to be reversed, both in absolute per capita terms and as a proportion of total health expenditures. The lower per capita GHE, rather than any large increases in private spending, probably accounts for the increased proportion of private expenditures from 2009. New rows have been added to this table showing per capita expenditure in constant (2013) prices, and GHE as a percentage of total government expenditure. The sharp decrease in this latter indicator from 2008 to 2011 due to a rapid rise in total government spending has apparently been slowed or reversed recently, especially as seen in the 2014 budget[55]. However, GHE per capita

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[54] World Bank (2011) Timor-Leste: Health Financing Note, updated based on WHO (2013) World Health Statistics 2013

[55] L'ao Hamatuk (2013) *2014 State Budget Book 4B*

in both nominal and constant dollars have declined sharply since 2008 until turning up in 2012 (not shown). Purchasing Power Parity (PPP) adjusted health spending is available from WHO for only two years and shows a surprising decrease from 2000 to 2010.  Table 8 shows the sharp increase in MoH budget from $46.5 million in 2012 ($42 per capita) to $61.5 million in 2013 ($55 per capita), and further projected increases through 2016 that are slightly greater than population growth.

### 3.3. Functional health budget allocation

Another health budget analysis[56] showed that the 2013 government budget was allocated almost equally among central MoH administration, hospitals (29.5%) and district health services (32.2%). The share going to the latter increased from 21.1% in 2012 to 32.2% in 2013, as seen in Table 7, but this almost certainly reflects an artefact from accounting changes. The latest Budget Book indicates a total 2014 MoH budget of US$67.22 million (US$61 per capita) and total district health services recurrent budget of US$15.86 million, or 23.5% of the total.  The 2014 referral hospital budget (for five hospitals) totals US$10.26 million, or 15.2% of GHE.

Only 38.7% of the Timor-Leste government health budget is spent at sub-national level (district health services and referral hospitals). This reflects diseconomies of scale in a small country making overhead costs relatively high. In comparison, Lao People's Democratic Republic (population 6.6 million) spent around 65% of GHE at sub-national level in recent years[57]. However diseconomies of scale are less apparent in Timor-Leste than elsewhere - a recent study found that 11 small island states in the Asia-Pacific region having the same average level of GDP per capita, spend an average of ten times as much per capita on health.[58]

At district level, Table 9 shows that since 2012, over half of all MoH wages and salaries are for district health services. An MoH expenditure review found that salaries comprised 37.8% of total district health spending in 2010, goods and services including drugs comprised 28.1%, and capital and development comprised 34.1%. The medicines and supplies budget at district level accounted for 9.1% of the total, and at US$1.2 million or US$1 per capita is about a quarter  of the national budget for drugs[59].

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[56] D. Northway (2013) East Timor Budget Analysis, Health Resource Facility

[57] World Bank (2013) Project Paper On A Proposed Additional Financing And Project Restructuring in the amount  of US$ 17.7 million to the Democratic Republic of Timor-Leste for the HSSPSP January 24, 2013 Human Development Sector East Asia and Pacific Region

[58] D. Whitaker, V. Walford and B. David (2013) Health care financing in the Asia Pacific region , HLSP Institute

[59] Ministry of Finance (2010) Expenditure Review Health sector Timor Leste

**Table 7: MoH Budget allocations by administrative level[60]**

| Administrative level | 2011 US$000 | % | 2012 US$000 | % | 2013 US$000 | % | 2014 US$000 | % | 2015 US$000 | % |
|---|---|---|---|---|---|---|---|---|---|---|
| Cabinet | 331 | 0.9 | 651 | 1.3 | 851 | 1.4 | 882 | 1.4 | 915 | 1.4 |
| MoH HQ | 13,445 | 37.6 | 22,038 | 44.1 | 20,985 | 34.1 | 21,821 | 34.1 | 22,694 | 34.1 |
| Hospitals | 12,502 | 34.9 | 9,917 | 19.9 | 18,136 | 29.5 | 18,854 | 29.5 | 19,615 | 29.5 |
| District Health Services | 7,636 | 21.3 | 10,552 | 21.1 | 19,791 | 32.2 | 20,565 | 32.2 | 21,401 | 32.2 |
| National Institutes | 967 | 2.7 | 866 | 1.7 | 899 | 1.5 | 931 | 1.5 | 970 | 1.5 |
| SAMES | 907 | 2.5 | 5,901 | 11.8 | 846 | 1.4 | 878 | 1.4 | 914 | 1.4 |
| **MOH Total** | **35,788** | **100** | **49,925** | **100** | **61,508** | **100** | **63,931** | **100** | **66,509** | **100** |

**Table 8:  MoH Budget allocations by economic category [61]**

| Economic Category | 2012 US$000 | % | 2013 US$000 | % | 2014 US$000 | % | 2015 US$000 | % | 2016 US$000 | % |
|---|---|---|---|---|---|---|---|---|---|---|
| Salaries and Wages | 15,967 | 34.3% | 22,468 | 36.5% | 27,283 | 40.6% | 28,374 | 40.6% | 29,509 | 40.6% |
| Goods and Services | 18,203 | 39.1% | 21,088 | 34.3% | 28,857 | 42.9% | 30,011 | 42.9% | 31,211 | 42.9% |
| Transfers | 9,380 | 20.2% | 10,663 | 17.3% | 9,000 | 13.4% | 9,360 | 13.4% | 9,734 | 13.4% |
| Minor Capital | 2,326 | 5.0% | 7,289 | 11.9% | 2,077 | 3.1% | 2,160 | 3.1% | 2,247 | 3.1% |
| Capital Development | 633 | 1.4% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Total** | **46,509** | **100.0%** | **61,508** | **100%** | **67,217** | **100.0%** | **69,905** | **100%** | **72,701** | **100%** |

Table 8 shows that the line item (goods and services) that includes drugs and supplies has been nearly doubled from 2012 to 2014, with smaller increases projected in future years. It is not believed that any government line item expenditures include donor inputs. Transfers, which are grants to civil sector organisations (CSOs)[62], are significantly lower than in previous budgets. (Tables 7 and 8 do not agree because only the latter has been updated.)

[60] D. Northway (2013) East Timor Budget Analysis, Health Resource Facility
[61] Updated From D. Northway (2013) East Timor Budget Analysis, Health Resource Facility
[62] Australian aid Dili health staff

**Table 9: Allocation of Salaries and Wages (from Northway HRF 2013)**

| Salaries and Wages | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | US$000 | % | US$000 | % | US$000 | % | US$000 | % | US$000 | % |
| Cabinet | 148 | 1.4 | 189 | 1.2 | 218 | 1.0 | 227 | 1.0 | 234 | 1.0 |
| MoH HQ | 1,310 | 12.0 | 1,352 | 8.3 | 1,669 | 7.4 | 1,735 | 7.4 | 1,803 | 7.4 |
| Hospitals | 4,160 | 38.0 | 5,105 | 31.5 | 5,804 | 25.8 | 6,037 | 25.8 | 6,277 | 25.8 |
| District Health Services | 4,638 | 42.4 | 8,716 | 53.8 | 13,962 | 62.1 | 14,522 | 62.1 | 15,093 | 62.1 |
| National Institutes | 403 | 3.7 | 553 | 3.4 | 407 | 1.8 | 423 | 1.8 | 439 | 1.8 |
| SAMES | 284 | 2.6 | 277 | 1.7 | 408 | 1.8 | 424 | 1.8 | 441 | 1.8 |
| **MOH Total** | **10,943** | **100** | **16,192** | **100** | **22,468** | **100** | **23,368** | **100** | **24,287** | **100** |

A higher percentage of the health budget will be used for salaries and wages than planned under the previous 2014 budget, increasing from 36.5% to 40.6%[63]. In Timor-Leste as in all countries, production of health services is very labour-intensive, and the proportion of personnel costs in the MoH is much higher than the 8-10% for Government as a whole[64]. Table 9 shows that of the total of US$22.47 million in salary and wages in 2013, 62.1% was spent for district health services and 25.8% on hospitals, of which half was for the National Hospital. Total budgets for 2014 and 2015 are about 5% higher than previously proposed, making the salary increase possible and also allowing increases for goods and services.

Currently, the drugs budget is supplied directly from Ministry of Finance (MoF) to SAMES for purchase of medicines for distribution to health facilities. The budget in 2011 was about US$3.8 million, and nearly US$1 million worth of pharmaceuticals for vertical programs were received from UNICEF, UNFPA and Global Fund. In 2012 the budget increased to US$5 million[65]. This per capita allocation of approximately US$4-5 per capita is in line with several other low and middle income countries (when program-supplied HIV/AIDS drugs are excluded[66].

## 3.4. Is the MoH budget equitable?

Large disparities exist in utilisation of critical maternal and child health services between rich and poor, and across districts which correlates with unequal maternal and child health outcomes. Compared to children from the wealthiest households,

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[63] Increased Salaries and Wages expenditure, to $160.5 million, is in line with the Government's policy of creating an effective civil service and improving the qualifications, professionalism and services provided by staff in key sectors such as security, higher education and health. The main policies which have increased expenditure on Salaries and Wages in 2013, compared to 2012, include: Increasing the Salaries and Wages budget for the Ministry of Health to $22.1 million, mainly due to the new career regime for health professionals. (source: State Budget 2013)

[64] State Budget books

[65] K. Holloway Regional Advisor in Essential Drugs and Other Medicines (2012) Timor-Leste Pharmaceuticals in Health Care Delivery Mission Report

[66] European Union (2012) Study of the Pharmaceutical sub-Sector in Zambia. Specific Contract ref n°: 2012/284573, 2012

children from the poorest households are 1.7 times more likely to die before their fifth birthday and 1.4 times more likely to be underweight. Overall utilisation of outpatient medical care is higher in richer families than in poor families, and utilisation of skilled ANC and delivery, and contraceptive prevalence are also higher. Immunisations, treatment of acute respiratory infections, and use of bed nets are higher among children from wealthier households[67].

When individuals seek outpatient care it is mostly from public providers. Public hospitals and community health centres account for over half of outpatient provision, including 96% of child visits. However, the poor rely more on health posts while the richest quintile obtain much of their care from public hospitals[68]. In contrast the use of inpatient care is unequal, with the richest quintile three times as likely to use public hospitals as the poorest quintile, and urban individuals 1.3 times more likely than those in rural areas. Spending on referral hospitals, which are located in towns, is about half of that on rural services, but it cannot be inferred that spending is not equitable. However, because wealthier people use the costlier hospital care disproportionally they benefit unequally from public spending on a per capita basis. Public sector facilities are in practice free to most patients, and informal payments are rare unlike in other countries such as Indonesia. Out-of-pocket spending on healthcare is low. Catastrophic and impoverishing expenditures for health are much lower than in most countries in the region.

## 3.5. Is the MoH budget targeted geographically at needs?

Most industrialised countries have adopted resource allocation formulae for health that take into account the relative need of geographic areas[69]. A MoF budget circular specifies that a share of 34% is retained from the total MoH budget for the districts to finance central services. The remainder of the budget for the districts is distributed using two criteria: (i) 70% is based on the population in a district (ii) of the final 30%, 60% is allocated on basis of their performance index and 40% on the difficulties of travel for outreach services. This guidance makes no mention of actual health needs[70]. A key challenge in the existing planning and budgeting system is the separation of district planning and budgeting processes (districts prepare their action plans but the budget is determined at the central level). The MoH has no effective mechanism to link district health plans with the MoH budget, sometimes leaving several planned district activities with no budget to implement them[71].

To test the degree that health needs are also met through the criteria mentioned in the budget circular, a crude calculation of per capita spend against need was carried out for this assignment. Districts were classified by giving equal weights to seven

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[67] Ministry of Health Dili (2011) National Health Sector Strategic Plan 2011 - 2030 Towards A Healthy East Timorese People In A Healthy Timor-Leste.

[68] Private, church, and traditional providers also account for a small share of overall provision.

[69] To introduce needs-based budgeting in Indonesia, a recent study (Ensor et al 2012) refined the approach to account for different local costs of delivering a package of services mandated to be provided by the public health system.

[70] Ministry of Finance (2010) Expenditure Review Health sector Timor Leste

[71] Asante, A et al. (2011) A review of health leadership and management capacity in Timor-Leste, Human Resources for Health Knowledge Hub, University of New South Wales, Sydney

health indicators from the TLDHS[72], giving a score of +1 if the indicator was above the average for the 12 districts (excluding Dili) and -1 if it was below. The district sum of the factor scores (which would be between a maximum of 7 and a minimum of -7) was used to classify the districts as very deprived, average, and less deprived. Recurrent budget allocations consist of salaries and wages, goods and services (including medicines) and minor capital expenses. As seen in Table 10 below, planned 2014 allocations range from US$11.59 to US$29.13 per capita. Recurrent expenditures are highest in the "least deprived" group of districts, followed by the "most deprived", with the middle group receiving the smallest recurrent budget. If this classification was accurate, it appears that budget allocation is related to current operating costs of existing district health facilities rather than the needs of the population. This is not surprising, since the health system infrastructure is still being rebuilt and becoming functional.

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[72] The seven indicators used are: per cent of births with skilled attendance, vaccination coverage (none), children 3SD height-for-age, female education, % in lowest income quintile, under-5 mortality, and neonatal mortality.

**Table 10: Recurrent and capital budgets for district health services, $US per capita (2014 State Budget books)**

|  | 'Deprivation' Index | recurrent budget 2014 | capital budget 2014 | total district level budget 2014 | 2014-2013 change in recurrent budget per capita |
|---|---|---|---|---|---|
| **Least** | | | | | |
| Aileu | 7 | 18.88 | 4.46 | 23.34 | -$5.92 |
| Viqueque | 3 | 22.10 | 12.09 | 34.19 | -$6.05 |
| Manatuto | 3 | 29.13 | 10.29 | 39.42 | -$2.48 |
| Liquica | 3 | 14.17 | 8.01 | 22.18 | -$2.43 |
|  | **mean** | **$21.07** | **8.71** | **29.78** | **-16.7%** |
| **Mid** | | | | | |
| Bobonaro | 2 | 11.69 | 8.63 | 20.32 | -$4.83 |
| Covalima | 1 | 19.08 | 11.37 | 30.45 | -$3.22 |
| Baucau | 1 | 11.74 | 15.75 | 27.49 | -$4.78 |
|  | **mean** | **14.17** | **11.92** | **26.09** | **-23.2%** |
| **Worst** | | | | | |
| Oecusse | -3 | 14.76 | 1.80 | 16.56 | -$5.26 |
| Ainaro | -7 | 15.70 | 3.68 | 19.38 | $0.31 |
| Ermera | -3 | 11.59 | 3.83 | 15.42 | -$3.44 |
| Lautem | -2 | 19.94 | 8.97 | 28.91 | -$3.84 |
| Manufahi | -5 | 25.39 | 17.14 | 42.53 | -$3.45 |
|  | **mean** | **$17.47** | **7.08** | **24.56** | **-15.2%** |

In most districts, the 2014 recurrent budgets are lower than for 2013, with cuts coming from staff costs while retaining expenditure on goods and services[73]. The average reduction in total budget was roughly 15% for the most deprived districts, and 18-23% for the others. Recurrent budgets for four of the five referral hospitals are significantly increased for 2014 (Baucau is the exception), but this is not entirely clear since as of 2014 the goods and services line for hospitals apparently was transferred to the Directorate for Hospital Services.
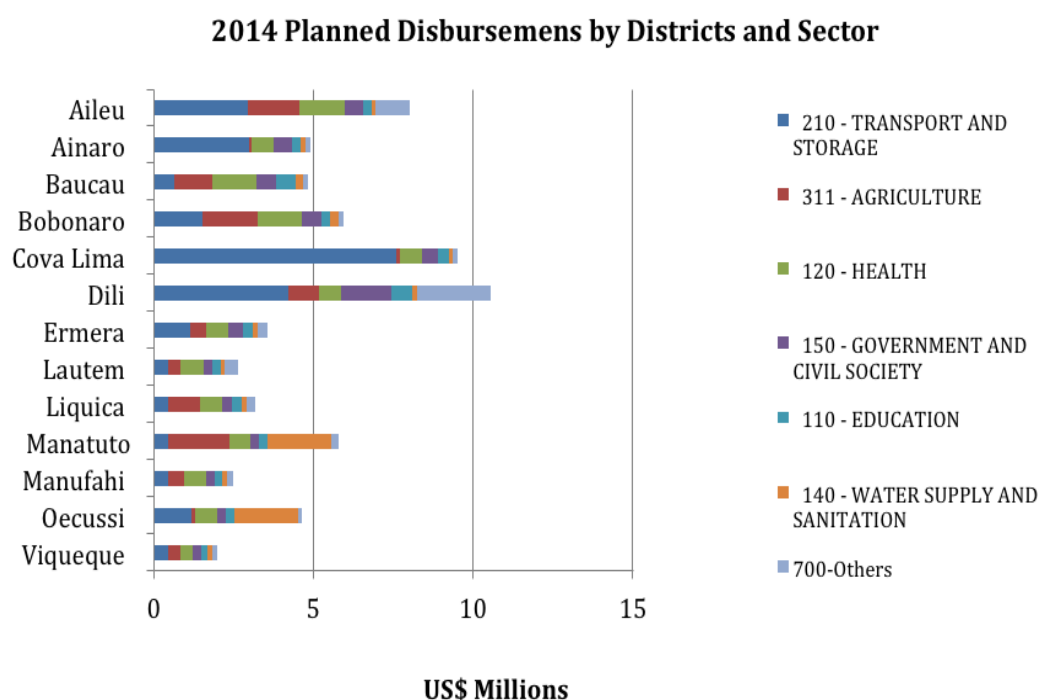
MoH capital spending for district health services is approximately half that of the recurrent budget, and as seen in Table 10 there is a wide range of capital financing

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[73] D. Northway (2013) East Timor Budget Analysis, Health Resource Facility

among districts, and the three middle-deprivation districts received the most on average.

Donor health budget allocations by district are still not transparent. The State 2014 Budget Book 6 lists MoH-administered activities financed by development partners that total US$32.83 million in 2014, down from US$40.17 million in 2013. The online Aid Transparency Portal is slow and incomplete, so it was not possible to find any relevant allocation data, and 2014 State Budget Book 6 includes no tables or details on how aid in the health sector has been allocated geographically. The only useful information is shown in Figure 5 and Table 11 below. It appears that about US$10.8 million, or one-third of aid to the health sector, is used for direct spending at district level. It is probably coincidence that this echoes the proportion of the government health budget allocated for district health services.  Donor inputs of around US$32 million when added to GHE of US$60-70 million result in total public health sector expenditures of around US$82 per capita[74].

**Figure 5: Donor project allocations** [75]



**2014 Planned Disbursemens by Districts and Sector**

US$ Millions

Legend:
- 210 - TRANSPORT AND STORAGE
- 311 - AGRICULTURE
- 120 - HEALTH
- 150 - GOVERNMENT AND CIVIL SOCIETY
- 110 - EDUCATION
- 140 - WATER SUPPLY AND SANITATION
- 700-Others

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[74] Capital spending is likely even higher than estimated here because district programs are also spending up on clinics and health posts and this data is not included in MoH budget data. All of these new/restored facilities will also need maintaining in the future. (Comment by Alan Foulkes 25 Nov. 2013)

[75] State Budget Book 5

**Table 11: District donor health spending (derived from Figure 5)**

| District | estimated donor assistance US$ millions to districts | donor assistance per capita US$ |
|----------|-----------------------|-----------------|
| Aileu | 1.4 | $30.06 |
| Ainaro | 0.7 | $11.26 |
| Baucau | 1.4 | $11.93 |
| Bobonaro | 1.4 | $14.48 |
| Covalima | 0.73 | $11.69 |
| Dili | 0.7 | $2.85 |
| Ermera | 0.72 | $5.85 |
| Liquica | 0.7 | $11.14 |
| Lautem | 0.72 | $10.81 |
| Manatuto | 0.6 | $11.74 |
| Manufahi | 0.7 | $15.59 |
| Oecusse | 0.6 | $8.92 |
| Viqueque | 0.4 | $5.44 |
| Total | 10.77 | |

## 3.6. Is public spending on health adequate for faster progress in RMNCH?

The cost of a minimum package of health services is now estimated by WHO as US$44 per capita for low and middle-income countries[76]. A needs-based costing for Timor-Leste health facilities has been carried out and determined that by 2014 a basic service package should cost an average of US$28 per capita[77], including services at referral hospitals[78]. This figure is based on the expected coverage in 2014 of 75%, but would rise to around $35 in 2018 as coverage and population continue to increase. Based on this information, it seems that the projected US$60-70 million GHE per year (Table 8) or $55-58 per capita would be sufficient to provide the basic service package at present: though only 32.2% of the total budget is for district health services, around half the 29.5% hospital expenditure is for the referral hospitals that provide a large part of health care to rural areas (the other half is for the National Hospital). This totals US$27.2 per capita for 2013.

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[76] WHO (2012) Global Health Expenditure Atlas – Factsheet, page 4.

[77] T. Ensor, H. Firdaus & T. Lievens  (2010) Health facilities costing in Timor-Leste Final Report  November 2010 Oxford Policy Management

[78] A similar methodology used in Indonesia in 2012 found somewhat lower per capita costs for a similar package (Ensor et al 2012).

Not all Government spending on health occurs through the MoH budget. Budget adequacy can be judged by progress toward achieving MDGs and show that the AARD for safe water and, especially improved sanitation, are far below that needed to meet the MDGs[79]. These are activities that are carried out mostly by NGOs (some supported by Australian aid) in Timor-Leste rather than through GoTL infrastructure spending.

Adequacy of the recurrent budget must also be considered not only in respect to the on-budget capital investments, but also to off-budget donor investments in infrastructure, vehicles, and even human capital. The problems of sector-wide coordination and transparency make this difficult to plan for, with the likelihood that projects are completed before government can staff and supply them.

The WHO calculations of budget gaps for accelerated progress toward the health MDGs (Figure 1 and Annex 3) are global in scope and are not intended to be a guide to resource allocation within any individual country. The total per capita health sector spending (including external aid) of US$82 per capita is in excess of the (global) estimated amount needed for accelerated progress to the health MDGs (Annex 3), but a relatively large portion of this is used at central MoH level. Both human resources and infrastructure appear to be priority budget items, but the data show clearly the need to increase spending in these areas. The health human resources development budget[80] is only US$250 000 for 2014 but rises to US$1.25 million from 2015 onward. Infrastructure investment totals US$4.77 million in the 2014 budget, with US$3.72 million of that for Baucau Hospital and the rest for a science building and a paediatric centre[81]. The MoH average budget execution rate for capital budget is less than 50% in recent years, compared to about 75% for the GoTL as a whole, and much lower than for the recurrent budget. This is possibly due to difficulties in moving construction projects forward, especially in rural areas.

To summarise the preceding issues, government spending on health has increased in the last few years, but the capital investments on infrastructure and human resources (primarily) that would allow higher efficiency of spending are not yet fully in place. Personnel policies on staffing and remuneration have been changed, resulting in more and presumably better motivated trained health human resources to relieve the constraints on health system performance. Spending on drugs and supplies has increased slightly and is probably sufficient now. The total spending on district services and referral hospitals is close to the full amount calculated needed for the BSP. Recurrent budgets are allocated according to the current number of facilities rather than actual health needs, but geographic differentials appear to be compensated somewhat by capital spending. External donors spend about half again the MoH budget but the effectiveness of the spending is difficult to estimate.

Adequacy of the recurrent budget must also be considered not only in respect to the on-budget capital investments, but also to off-budget and donor investments in infrastructure, vehicles, and even human capital. The problems of sector-wide

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[79] WHO (2013) Health Statistics 2013
[80] It is not stated what this comprises
[81] From 2014 Budget Book 6 Table 1

coordination and transparency make this difficult to plan for, and it is possible that projects are completed before government can staff and supply them.

## Conclusions

1. The health system support activities proposed under the Program are likely to be worthwhile in the short term if they are targeted carefully to priority needs. Repairing ambulances can be a very efficient use of resources when the health facilities are otherwise capable of delivering services. Filling gaps in critical human resources should be very useful but there are unanswered questions concerning the feasibility of the recruitment and support of Indonesian staff. Other health system building blocks that are not now addressed by other programs could also be supported by building capacity, but piecemeal interventions to strengthen weak links in the health system will not improve health outcomes unless they result in capacity to plan, implement, and sustain activities and adapt to changing conditions. There is a tradeoff between applying immediate solutions such as providing badly needed infrastructure, and making investments that take longer and are more costly but are more likely to have a lasting impact.

2. Current government health expenditure is rather low but is not the only factor holding back rapid progress toward health goals. The gap between the potential of technical interventions to improve health and actual RMNCH outcomes is due mostly to weak links in the health system. The critical need for health system improvements to meet the MDG targets including those for RMNCH is documented globally and is estimated to cost much more than the technical interventions.

3. Timor-Leste gets reasonably good results from government health expenditures, although it is difficult to assess this when the health system is in a state of rapid development and needing high capital investment. The efficiency of budget spending also may be limited to an extent by the unavoidably high proportion going to central administrative and technical directorates. Some important health interventions such as water and sanitation may be underfunded but are outside the scope of MoH functions.

4. Development partners will provide less health financing in coming years than in the past, about US$32 million in 2014. When added to the government health budget of US$60 million, this raises total public health expenditure to about US$82 per capita in the coming years. A needs-based costing of Timor-Leste health facilities determined that by 2014 a BSP would cost $28 per capita (including referral hospitals), rising to US$35 as coverage and population increase. While a WHO global estimate for all LMICs should not be taken to represent Timor-Leste's investment needs, costs of accelerated progress to meet the health MDGs could cost an additional US$30-US$40 per capita for infrastructure, human resources and other system strengthening. Even with relatively high MoH overhead costs, current spending levels of US$82 per capita should cover required funding for the BSP, but spending on the investments needed for accelerated progress is likely to fall short of needs. The GoTL has demonstrated the political will to finance both cost-effective technical

interventions and HSS interventions while also investing in human and physical capital, but its limited contributions may prevent more rapid progress. The chosen strategy for the new up to A$50 million Australian aid program appropriately focuses on investment gaps, and will increase total health financing by almost US$10 per capita.

# Annex 1: Scoping Note: Economic Analysis for the Design of the Timor-Leste Health Program

## 1. Purpose

**The purpose of** this study is to prepare background economic analysis to inform the design of the Timor-Leste Health Program, 2013—2021.

## 2. Background

The Australian aid program has approved a new, nationwide, eight-year investment in maternal and child health in Timor-Leste. The strategic goal of the investment is to enable mothers and their children to live longer, healthier and happier lives. As outlined in the Concept Note (January 2013), the end-of-program outcome is that 'households, especially the most vulnerable, increasingly practice behaviours that are conducive to better maternal and child health and nutrition and use reproductive, maternal, newborn and child health services.'

The Concept Note identifies several modalities and interventions through which the Program could achieve its strategic goal and desired end-of-program outcome. The options include both demand-side and supply-side measures. It is understood that the design of the Program needs to maintain flexibility in order to deploy the most appropriate instrument for local circumstances, given the national scope of the Program.  A key principal of the initiative will be to work through and strengthen country owned Ministry of Health systems and services, and to move away from contracting parallel projects and services, even if these may offer a quicker/cheaper returns in the short-term.  The challenge will be to move from an emergency aid response to a nationally- aligned, sustainable, system strengthening one, in line with the principles of effective development cooperation.

Design documentation is to be completed by December 2013, with implementation beginning in 2014.

## 3. Scope

A desk-based study will seek to address the following set of high-order economic questions as far as possible with existing data. It is expected that this list of questions will be refined (and possibly added to) during the course of the work.

- What is the existing situation of the 'market' for health services in TL? In what ways is it succeeding, in what ways is it failing, and why?

- What sorts of interventions are likely to be most effective in the short and long term at improving maternal, child and neo-natal health in TL? How would they improve health care access and/or quality in the long-term, or will they only work in the short-term?

- How could the most effective portfolio of demand-side and supply-side interventions be determined?

- How efficient is current government allocation and expenditure for health? How could government better use the $60 per capita spend to improve maternal and child health outcomes, and how is it currently spent?

- Is current and forecasted government and donor health allocation and expenditure sufficient to meet Ministry of Health 2017 targets?

Questions should be addressed from the perspective of cost-effectiveness and value-for-money; the aims of the Program; efficiency of implementation; and the overall effectiveness of the Program in terms of poverty alleviation and supporting the state in delivering effective and responsive health services. This is in-keeping with Australian aid's commitments to engaging in fragile states, as embodied in the GPEDC and *New Deal* principles.

The findings of the study will form an input to the design process, and provide evidence-based analysis upon which the authors of the design documentation can draw, building on international experience and best practice. It may also point to areas where further analysis is required to be able to guide the design team.

*Australian aid is aware that reliable data for Timor-Leste is not always available, and that when it is available, it is not always comprehensive. Accordingly, the analysis should be adjusted to note and reflect such constraints, and ensure that the strength of any conclusions reflects the strength of the evidence available.*

## 4. Tasks

The Health Economist will undertake the following main tasks:

1. Prepare an analytical plan outline a methodology for collecting and analysing data in consultation with the Timor-Leste health team. To be submitted via email by

2. Source additional information and review the following sources of information to understand best-practice and build an evidence base:
   - World Bank Project Paper for NHSSP-SP (2011)
   - Expenditure Review Health Sector, Timor Leste, Ministry of Finance (2010)
   - Preliminary Observations on Service Delivery Bottlenecks, Kathy Whimp (2010)
   - Health Financing Note, World Bank, 2011
   - GoTL Transparency Portal and Budget Books
   - Demographic and Health Survey, 2009-10
   - Impact of out-of-pocket expenditures on families and barriers to use of maternal and child health services in Timor-Leste, Ravi (2012)

- Review of 2013 Health Budget, Health Resource Facility (2013)

- Summary of MoH Sub-national projects in the 2013 budget

- Selected district health budgets

- PFM Action and Detailed Plan (for NHSSP-SP)

3. Prepare a draft economic analysis to support the new health design addressing the questions listed below:

   o What is the existing situation of the 'market' for health services in TL? In what ways is it succeeding, in what ways is it failing, and why?

   o What sorts of interventions are likely to be most effective in the short and long term at improving maternal, child and neo-natal health in TL? How would they improve health care access and/or quality in the long-term, or will they only work in the short-term? (Note: Summarising what is known internationally and in Timor about cost-effectiveness of RMNCH interventions. Use this information to propose possible prioritisation of RMNCH interventions to meet Timorese health needs.

   o How could the most effective portfolio of demand-side and supply-side interventions be determined?

   o How efficient is current government allocation and expenditure for health? How could government better use the $60 per capita spend to improve maternal and child health outcomes, and how is it currently spent?

   o Is current and forecasted government and donor health allocation and expenditure sufficient to meet Ministry of Health 2017 targets?

The availability and quality of the data will to some extent determine the way that the questions are answered in the analysis. The answers will present a discussion of the issues based on available materials. It is unlikely that modelling of data for a cost effectiveness analysis or to determine outputs will be possible.

4. Liaise regularly with the TL health team, the Economics Advisory Group (EAG) and other key stakeholders. The adviser may well need to conduct in telephone interviews with key informants which may include the following (but is not limited to):

- WHO Timor-Leste

- World Bank Timor-Leste

- AusAID EAG Staff, Canberra

- AusAID staff – particularly, in-country staff

Senior Officer (Health), Dili and Senior Officer (Health), Canberra will work with the adviser to schedule any telephone interviews.

## 5. Inputs

Indicatively, the Health Economist will provide up to **14 days** of inputs through desk based work. The number of days can be reviewed after the health economist has completed the background reading and prepared the analytical plan. There is some flexibility to negotiate availability and timing. An indication of the approximate split of days and inputs are detailed in the table below:

| Activity | Input | Indicative Timing / Location | Number of days allowed (upper limit) |
|---|---|---|---|
| Initial briefing with AusAID health team | Teleconference to discuss background to design and ToR | Week of 23 September 2013, via teleconference | 0.5 days |
| Background reading | Source and review background documents relevant to the health design in Timor-Leste | Begin week of 23 September 2013 | 5 days |
| Prepare analytical Plan | Analytical Plan | Submit by 27 September 2013 | 0.5 day |
| Feedback from AusAID on analytical plan | Teleconference to discuss analytical plan and review scope of work | Week 30 September | 0.5 |
| Draft Report | Prepare draft report addressing higher order economic questions using available data and information | Submit by 25 October 2013 | 5 days |
| Review & discuss feedback | Teleconference to discuss draft report | Week 28 October 2013 | 0.5 days |
| Finalise report | Final Report | Submit by 8 November 2013 | 2 days |

## 6. Outputs and Reporting

The Health Economist must provide the following reports by the date, in the format and the number of copies indicated:

(a) Analytical plan detailing method for analysing existing information and identifying further information that will be required to address key questions.

(b) Written report which present the analysis and summarises the findings of the research. No more than 20 pages. Final report to be submitted by email 8th November.

## 7. Stakeholders

- TL Health Team—Sarah Lendon, Desmond Whyms, Mia Thornton, Renee Paxton

- Economic Analyst, TL Section—Darrell Hawkins

- Senior Economist, East Asia Division—Nick Cumpston

- Economics Advisory Group – Jay Sagani, Chris Hoy.

The final report will be reviewed and quality-assured by the Senior Economist, EAD (if available) or another Senior Economist from the AusAID Economics Network. The main audience for the analysis will be the internal AusAID team that is working on the design of the Timor-Leste Health Program, including the design team itself and other stakeholders in AusAID.

## 8. Management.

The consultant will report directly to Desmond Whyms, Senior Health Specialist, Dili, Timor-Leste.

## 9. Qualifications and Experience

This assignment requires a health economist with appropriate academic credentials and at least 10 years of experience in conducting value for money assessments and in health sectors in developing countries. Knowledge of Timor-Leste and/or one of its languages is an advantage.

## 10. Adviser Remuneration Framework

Discipline Group C, Economics/Financial Analysis, Job Level 3 – with 10 or more years relevant professional experience

# Annex 2: Project Note November 2013

AUSAID TIMOR LESTE - **PROPOSED SUPPORT FOR HEALTH SECTOR DEVELOPMENT**

## The purpose of this note

The Government of Timor-Leste has ambitious plans for improving health. AusAID has been discussing with the Minister of Health and his colleagues how Australian support could best be used to help them implement those plans. This note captures the discussions to date.

AusAID is committed to improving the way it works in partnership with the Ministry of Health. The way of work and our support is based on four core principles that:

1. give priority to the people who **most need** primary health services – vulnerable women and children in rural and remote areas

2. involves transparent joint partnership based on mutual trust and reflecting New Deal principles, and supporting **country ownership** and capacity through: alignment with **national plans** and priorities, , working through and helping strengthen **national systems** for planning, budgeting, financing, delivering and reporting; **harmonisation** with other partners, and **mutual accountability** for behaviour change and results.

3. is based on an understanding of the entire **health sector** as a complex and dynamic system within which various elements – across the demand side as well as the supply side – interact.

4. is focused on a two track process (1) **accelerated access to basic health care services.** Support for GOTL plans to establish functioning Health Posts in each suco by 2017 with one doctor, two nurses, two midwives and one lab technician and (2) **sustainable support for institutional development.**

## Key documents describe the challenges and the plans

The Government's ambitions for improving health outcomes and services are set out in the Strategic Development Plan, the Program of the Fifth Constitutional Government, Budget papers and the National Health Sector Strategic Plan (NHSSP). NHSSP policy objectives are grouped under five headings. These headings are reflected in the Program of the Fifth Constitutional Government and 2013 Budget. The five objectives are:

1. **Managing the national health system**, including: stewardship, organisation and management of health services provision to ensure effectiveness and impact;

2. **Delivery of health services**, including: strategic directions for every level of health care; basic packages of health services; and national priority health programs (including health promotion);

3. **Human resources for health (HRH)**, including: development and management of HRH, with a focus on priority weaknesses, such as midwifery to increase skilled birth attendance;

4. **Health infrastructure**, including: physical infrastructure; medical equipment and essential non-medical supplies; transport and ambulance services, communications and Information and Technology (ICT);

5. **Support services**, including: drugs and consumables; laboratory and blood bank services; health research; HMIS; planning and financial management systems; and health partnership and collaboration.

**What is AusAID proposing to support in health?**

This is a long-term program of support over 8 years. We will start by focusing on the priority problems raised by the Ministry and confirmed through AusAID's analysis. Suggested timing could be:

**Phase 1 - September 2013**: **Health transport**: Start support to maintain health vehicles and ambulances, including broader assessment of the problem and supporting long-term solutions. This would involve a mobile mechanic team that travels around the districts assessing the problems, fixing small problems and identifying solutions action for more serious problems. The vehicles would include Ministry of Health ambulances, multifunction vehicles, cars and motorbikes.

**Phase 2 - Early 2014**: **Health equipment**: Start support to maintain and repair critical health equipment for maternal child health in national hospital, referral hospitals and CHCs. Take a coaching and mentoring approach to assess the problem, and work through long-term solutions with the Ministry of Health team.

**Phase 3 - Mid 2014**: Human resources for health: recruit and pay midwives and nurses from Indonesia to work in HPs and CHCs as an interim measure (pending the increased supply of these cadres from Government training institutions); explore options for developing sustainable solutions for human resources constraints

Future support will be identified through regular planning processes and discussions with the Ministry of Health. Discussions to-date suggest it may include:

- Health infrastructure: contract a firm to **rehabilitate health posts**, construct basic accommodation for health workers; Support for ICT equipment (NB associated in-service training can be provided under the Human Resources objective) especially at Health Posts, CHCs and Districts; Support to develop, integrate, implement and monitor a **systematic plan for transport management** (vehicles, fuel and drivers); Support to developing/implementing a **maintenance plan for health facilities**

- Delivery of health services: support NGOs to work with local health staff and PSFs to help them improve **health promotion interventions and BCC**, including mobilising community groups and local leaders for increased action on maternal and child health; Support for partnerships (e.g. with civil society organisations) to test, refine and roll out locally appropriate approaches to empowering and **mobilising communities**, especially for RMNCH and nutrition

- Support services: Explore with Red Cross if they could provide **blood bank** services and, if so, contract and fund these services whilst working with MOH to strengthen their capacity to contract this service directly; **Drugs and consumables**: support to help reform management of SAMES or its successor; **Laboratory and blood bank services**: support to MOH in taking over contracting blood bank services from Red Cross; HMIS: Support for **HMIS database management**, and use of HMIS info for decision-making

- Human resources for health: Support to implement key components of comprehensive plan for **HR development** (drafted under NHSSP-SP) e.g. for strengthening **UNTL capacity** to train key cadres; Support to develop a system for HR management to roll out new mechanisms as needed (especially for cadres that deliver RMNCH care); engage NGOs to help **strengthen MoH supervision** of providers of reproductive, maternal, neonatal and child health care services.

**How will AusAID support the Ministry?**

We propose to use three main modalities to support the Ministry of Health:

1. Procurement and Logistics Facility focusing on health transport and infrastructure (starting in September 2013)

2. Health Contractor who can provide health specific support and sub-contract other partners like NGOs like Health Alliance International (starting in mid-2014 following AusAID procurement)

3. Possible partnership with WHO and World Bank on analysis and technical support (existing partnership with World Bank, possible future partnership with WHO could start in 2014)

**What are the next steps?**

1. We start the **health transport support in September 2013** with a team from the National Directorate of Administration and Human Resources and National Directorate of Support and Hospital Services.

2. Minister signs off on the approach and provides a **letter of support by November 2013**. AusAID would be happy to present at the Council of Directors or to have some workshops or meetings to explain the new program.

3. AusAID puts a tender out for the **health contractors**. Ministry of Health joins AusAID on the Technical Advisory Panel that recruits the contractor.

4. The full program with support by the health contractors would commence **August 2014**.

5. **Review progress and identify program priorities** within MoH planning process in May and June 2014, when MoH is putting together their budget submission or MoF.

## Annex 3: Global Incremental costs (2005 constant dollars) of meeting health MDGs 4, 5, and 6 by year

**Table 1A. Incremental costs by year, by disease and health system building block**

| In US$ billions | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | Total | % |
|---|---|---|---|---|---|---|---|---|---|
| **Programme and disease** | | | | | | | | | |
| Management of childhood illness* | 0.14 | 0.16 | 0.24 | 0.35 | 0.45 | 0.53 | 0.66 | 2.53 | 1% |
| Immunization | 0.66 | 0.67 | 1.04 | 0.91 | 1.10 | 0.91 | 0.97 | 6.27 | 2% |
| Maternal health | 0.70 | 0.91 | 1.21 | 1.50 | 2.03 | 2.51 | 2.97 | 11.82 | 5% |
| Family planning | 1.00 | 1.22 | 1.46 | 1.39 | 1.32 | 1.16 | 0.88 | 8.43 | 3% |
| Tuberculosis | 0.61 | 0.67 | 0.67 | 0.69 | 0.70 | 0.71 | 0.73 | 4.78 | 2% |
| Malaria | 1.04 | 1.05 | 0.94 | 1.17 | 0.95 | 0.96 | 1.14 | 7.25 | 3% |
| HIV / AIDS | 0.56 | 1.12 | 1.65 | 2.17 | 2.69 | 3.23 | 3.73 | 15.13 | 6% |
| Essential drugs ** | 0.53 | 0.63 | 0.83 | 1.10 | 1.36 | 1.84 | 3.17 | 9.48 | 4% |
| **Subtotal** | 5.23 | 6.43 | 8.03 | 9.29 | 10.62 | 11.85 | 14.25 | 65.70 | 26% |
| **Health system building block** | | | | | | | | | |
| Governance (including drug regulation) | 0.62 | 0.60 | 0.83 | 0.84 | 0.85 | 0.92 | 0.90 | 5.56 | 2% |
| Infrastructure, equipment and vehicles | 8.34 | 12.84 | 17.33 | 18.45 | 13.09 | 11.42 | 9.75 | 91.23 | 36% |
| Human resources for health | 3.28 | 5.31 | 7.24 | 9.30 | 10.61 | 12.33 | 14.20 | 62.28 | 25% |
| Supply chain / logistics | 1.18 | 0.86 | 1.41 | 2.08 | 2.14 | 2.63 | 2.51 | 12.82 | 5% |
| Health information system | 0.37 | 0.94 | 0.44 | 0.70 | 0.69 | 0.69 | 0.69 | 4.52 | 2% |
| Health financing | 0.32 | 0.49 | 0.73 | 1.13 | 1.55 | 2.26 | 2.85 | 9.34 | 4% |
| **Subtotal** | 14.11 | 21.04 | 27.98 | 32.50 | 28.94 | 30.26 | 30.90 | 185.73 | 74% |
| **Total (US$ billions)** | 19.34 | 27.47 | 36.01 | 41.79 | 39.56 | 42.11 | 45.16 | 251.44 | 100% |
| **Total per capita (US$)** | 14.20 | 19.75 | 25.35 | 28.82 | 26.72 | 27.87 | 29.30 | 172.01 | |

[82]

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[82] Constraints to Scaling Up the Health Millennium Development Goals: Costing and Financial Gap Analysis Background Document for the Taskforce on Innovative International Financing for Health Systems Working Group 1: Constraints to Scaling Up and Costs, WHO 2010

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[i] Note: many different definitions of 'fragile' exist. Sumner examined six leading lists, and found that the proportion of poor in fragile states could vary between 6 and 40%, with his analysis concluding 38%, of which 18% were in LICs. Sumner(2012), p9.