Papua New Guinea (PNG)
Medical Supply Reform Impact Evaluation: Year 1
MANAGEMENT RESPONSE

Initiative Summary

Initiative Names	**PNG Health and HIV Procurement Program** **PNG Health Service Provision Facility**		
AidWorks initiative number	INK 212; INJ708		
Commencement date	1 March 2011	Completion date	30 June 2014
Total Australian $	Total – $60,824,175[1]		
Delivery organisation(s)	International Dispensary Association Foundation; Charles Kendall & Partners		
Implementing partner(s)	PNG National Department of Health; Provincial Governments and Provincial Health Authorities; Christian Health Services; World Health Organisation		
Country/Region	Papua New Guinea		
Primary sector	Health		
Initiative objective/s	Increased percentage of months that health facilities do not have stock-outs of all selected medical supplies for more than one week per month (from 47 per cent in 2010 to 85 per cent in 2015).		

Evaluation Summary

Evaluation Objectives: The objectives of this evaluation are:

- To verify the efficiency, sustainability and achievement of, or progress towards, the expected intermediate or end-of-program outcomes of the Papua New Guinea (PNG) sector-wide medical supply reforms and their contribution to health service delivery outcomes in PNG; and
- To generate knowledge and lessons for developing countries and development partners on how direct service delivery reforms can be sustainably implemented in PNG (and similar Pacific and/or decentralised settings, with a focus on poverty, equity, and maternal and child health targeting).

Evaluation Completion Date: December 2013.

Evaluation Team: Burnet Institute, Health and HIV Implementing Services Provider (HHISP) and the University of PNG's School of Medical and Health Sciences.

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[1] This is comprised of procurement of 100 per cent medical supply kits ($24,777,666); distribution of 40 per cent and 100 per cent medical supply kits ($30,647,620) and procurement and distribution of emergency obstetric care kits and cold chain equipment ($5,389,889).

DFAT's response to the evaluation report

The Burnet Institute, in partnership with the University of PNG's (UPNG) School of Medical and Health Sciences and the HHISP, conducted this evaluation in PNG between May-July 2013. This was comprised of:

- Technical review committee (TRC) meetings in May and December 2013 to refine methodology and peer review findings respectively;
- National stakeholder consultations and survey design and testing in May and June 2013;
- A field survey was conducted by four international consultants, five UPNG staff, and 61 UPNG students during 6 – 22 June 2013. This included visits to 103 health facilities and eight medical stores, interviews with 487 patients, and observations of 1,088 prescriptions; and
- Written surveys, semi-structured interviews and focus group discussions were conducted with 28 provincial, 57 district, and 46 church health service health managers from all provinces in PNG.

The Australian Department of Foreign Affairs and Trade (DFAT) assesses this evaluation report to be of high quality due to:

- Use of mixed-method evaluation approaches in collecting quantitative and qualitative evidence;
- Use of internationally comparable methodology – the World Health Organisation (WHO)'s *Operational Package for Assessing, Monitoring and Evaluation Country Pharmaceutical Situations*; and
- Peer review by local and international specialists to refine methodology and findings.

Overall Assessment of Findings and Recommendations

DFAT supports the overall evaluation findings and recommendations. We agree with the evaluation criteria ratings listed below on the basis of information available during the evaluation phase (May-July 2013). However, given the Australian Government's views on the process and outcome of the Government of PNG tender for procurement of 100 per cent medical supply kits in 2013 (discussed below), we believe that prospects for sustainability of program benefits are less than satisfactory (rating: 3).

Table 1: Evaluation Criteria Ratings

Evaluation Criteria	Rating (1-6)	Explanation
Relevance	5	All stakeholders recognise this as a critical and urgent health system need. The Australian Government investment is appropriately targeting both rapid improvement in service delivery as well as medium-term system reforms.
Effectiveness	5	There has been a clear boost to availability of essential and life-saving medicines through the investment, especially in the most remote facilities, with equitable penetration into sites designated as 'high-poverty' districts.
Efficiency	4	There is good value-for-money for commodities, and good quality assurance (for example in validating deliveries). The expected inefficiencies inherent in any standardised 'push' system were observed, and some aspects of quantification, targeting, and co-ordination of supplies could be improved.
Sustainability	4	Sustainability is hampered by dependence on Government of PNG policy and practice reforms, which are progressing slowly. However such 'push' systems are likely to be needed as a stop-gap measure for several more years, and this investment demonstrates a feasible means to do this.

Evaluation Criteria	Rating (1-6)	Explanation
Gender equality	4	The investment preferences supplies of benefit to mothers, their children, and women in general. Direct delivery to remote facilities is likely to reduce healthcare travel and other costs that are disproportionately borne by women. There has been limited opportunity to increase women's participation in decision-making or policy.

Rating scale

Satisfactory		**Less than satisfactory**	
6	Very high quality	**3**	Less than adequate quality
5	Good quality	**2**	Poor quality
4	Adequate quality	**1**	Very poor quality

This evaluation report demonstrates that availability of essential medicines in first-line health facilities in PNG has increased in recent years, largely due to the impact of 'push' systems such as Australian Government funded health centre and aid post kit distribution. This has reached even remote facilities and those in poor districts, and represents a significant increase in their capacity to treat common and life-threatening diseases. The evaluation demonstrates that the 'push' distribution is highly valued and sometimes the only mechanism to enable continued service provision, especially for more remote facilities and the aid post level. However, it also notes that overall stock-outs are still common and the majority of health facilities privately purchase routine supplementary medicines or instruct patients to purchase medicines that are not available in facilities.

The report also identifies areas for improvement for the Australian Government funded medical supply kit distribution, particularly in coordination and communication, accurate quantification of needs at various levels, and other potential integration of management with the government 'pull' system. DFAT accepts these findings and recommendations to address weaknesses for any future support in this area.

National Planning and Budgeting

The evaluation confirms that Australian aid procurement of 100 per cent medical supply kits from the International Dispensary Association (IDA) Foundation achieved acceptable value-for-money. The evaluation found that advance payments for the 100 per cent medical supply kits allowed the the pharmaceutical supply contractor to negotiate advantageous pricing for the duration of the 100 per cent medical supply kit contract (around 18 months). Australia procured these medical supply kits as an emergency request by the Secretary for Health (Dr Clement Malau) in April 2011, due to reports of widespread national stock-outs of medicines. The National Department of Health (NDoH) had already progressed kit quantifications and negotiations with IDA Foundation, however were unable to secure approval to direct source from an internationally quality-assured supplier.

The evaluation identified that the kit medicines content have been a good fit for the disease burden in PNG. It found that most reports of non-usage of kit medicines related to issues of staff training or authorization, rather than absence of the relevant disease. The evaluation noted that the kit cost could have been more cost effective if quantities were closer to what was required in each facility, and that some contents were in over-supply (such as intravenous fluids). Determining quantities for each facility was conducted by WHO, on behalf of NDoH, and based on international standardized morbidity and mortality data together with a comparison of the United Nations emergency kit. It was tailored to PNG using National Health Information System (NHIS) outpatient data, with one health centre kit equated to 5,000 outpatient visits per year.

The evaluation also noted the practical difficulties of achieving accurate quantities due to out-dated or incomplete information for health facilities, such as annual outpatient numbers and previous data on medicine use. It noted it was not possible to incorporate information on disease profiles derived from local settings in PNG. DFAT

acknowledged the issue of over-supply and as a result of feedback and monitoring, ensured that Rounds 3 and 5 adjusted any over-supplies to health facilities based on provincial and district level feedback.

Procurement Tendering and Governance

As part of a medical supply reform agreement, the Australian Government agreed to assist the Government of PNG improve its procurement tender and governance arrangements for the 2014 tender for 100 per cent medical supply kits. Under this arrangement, the Government of PNG would fund the procurement, with the Australian Government to then fund the distribution of kits over 2014-2016 subject to an international competitive, transparent and fair tender process and awarding the contract to a quality-assured supplier.

The evaluation assessed that the tender approach was a significant development in tendering practice for PNG, as it included international competitive tendering and conditions specifying the need for quality-assurance standards to be met by tenderers. However, following consultations in June 2013, the evaluation concluded that while showing some signs of change, these procurement systems still have yet to display required systems for establishing transparency, accountability, quality and value for money.

In December 2013, DFAT determined that the tender outcome did not comply with the mandatory requirements, as the chosen supplier is not ISO9001:2008 compliant, and have expressed concerns that the tender process was not fair or transparent. In these circumstances, the Australian Government will not fund the distribution of the medical supply kits resulting from this tender. The Australian Government has reiterated its support for the establishment of an independent health procurement authority, which has been recommended by the current Minister for Health and HIV, in 2014.

Quality Control and Regulation

The evaluation found that there were fewer instances of poor drug quality in 100 per cent medical supply kit medicines (11 per cent) compared to non-kit medicines (26 per cent). The evaluation noted that quality of medicines is also affected by deficiencies in storage and handling at various levels; and the measures defined above as 'drug quality' above were medicines discolouration, medicines broken/crumbled and containers broken/cracked. The evaluation confirmed that the IDA foundation have a comprehensive quality-assurance system that Good Manufacturing Practice (GMP) audits at manufacturer's sites, inspection of production lines, later evaluation and approval of batches of production, with occasional verification audits supplemented by chemical testing or visual inspection as needed.

DFAT supports the evaluation's conclusion that in the absence of in-country testing, the strongest approach to quality is to require compliance with international quality standards on the part of suppliers and the pharmaceutical manufacturers they procure from, with the 100 per cent kits supply representing the most recent comprehensive example of this.

The evaluation identified many North China Pharmaceutical Corporation (NCPC) medicines in circulation in PNG, including that six out of the 10 tracer medicines available at medical stores were manufactured by NCPC. The evaluation highlighted concerns with previously identified substandard medicines manufactured by NCPC and the need for further study and regular vigilance to review the quality assurances provided by this company in particular and all manufacturers in general. The evaluation noted that the IDA Foundation have only approved two types of medicine from this supplier (powder for injection of beta-lactams and cephalosporins), from among the wide range of products NCPC produces at its many manufacturing sites. The IDA Foundation noted that the NCPC products it supplies to the 100 per cent kits (Ampicillin injection and Benzathine penicillin injection) have been checked and approved by their internal quality assurance processes, however their approval does not extend to the many other NCPC pharmaceuticals in circulation.

Distribution

The evaluation identified both strengths and weaknesses in Australian Government funded distribution of medical supply kits (managed by procurement agent Charles Kendal and Partners). Key strengths included:

- High appreciation of the 'push' system by staff, noting that it often enabled services to continue by providing a crucial supplement to fill gaps in supply from the 'pull' system, especially for aid posts. Kits

often were reported to serve as the primary supply source, and that without them, many facilities would not have had medicines. The low rate of 'dissatisfied' comments (health centre – 2 per cent, aid post – 1 per cent) confirms the value seen in the program.

- Direct distribution to health centre and aid posts received very positive opinions, and was associated with greater penetration than the 'pull' system, increased availability of services, and decreased cost to the health facility and community.
- Allocating responsibility by region, across three contractors with local strengths, was an effective way to apportion contracts and that the contract conditions, while onerous in monitoring, did help assure delivery.
- Approach to verifying deliveries ('geo-pics') has contributed to provincial health agencies in updating their own facility listings, and supporting the UPNG Remote Sensing Centre to create a national database.
- Reduction in unnecessary referrals: "since the start of this program, more patients are admitted at the aid post, instead of the health centre … or the hospital".

The evaluation also identified weaknesses in distribution and areas for improvement:

- Criticisms of poor communication between kit delivery contractors and provincial/district health managers point to the need for integrated and more consultative planning and future 'push' system distribution. DFAT acknowledges this as an area for improvement. In response to feedback regarding communication and coordination issues, DFAT increased contractor staffing and facilitated a contract amendment with each sub-contractor to ensure the distributors regularly met with the provincial health office to provide delivery schedules in advance, distribution progress updates, and to discuss difficult to reach locations. DFAT also supplemented these consultations with email, fax and phone updates to the provincial level. In Sandaun province, DFAT, the provincial health adviser, district managers, and the sub-contractor held a planning workshop to identify correct facility locations, appropriate logistics routes and consultation plans.
- Inconsistencies in camera-based 'geo-pics' sometimes do not detect the correct location resulting in invoicing disputes, noting that a UPNG mapping expert agreed this can occur with incorrect camera use, underlining the importance of consistent equipment and adequate training.
- Examples of 'failed' kit deliveries, such as instances where facilities had not received kits either through not being listed appropriately or through transport failures, and deliveries to the wrong site. In any case where there were reports of irregularities in delivery of kit medicines, DFAT instructed the managing contractor Charles Kendall and Partners to investigate. A small number of delivery irregularities were investigated and were found not to be cases of fraudulent activity by Charles Kendall and Partners' sub-contractors. In some cases the kits for closed or inaccessible facilities were delivered to nearby facilities, as per the contracts requirements. In other cases, the kits were legitimately stored at transit stores, and in one case the empty IDA Foundation boxes were repacked using 'pull' system medicines that subsequently failed to arrive at their intended destination. The evaluation also notes that the majority of qualitative data, especially from health facility staff, supports contractor reports that only a very small proportion of kit deliveries experienced irregularities.
- For issues and responses to oversupply of IV fluids, see 'National Planning and Budgeting' above, and for use of category C and D medicines, see 'Rational Use of Medicines' below.

The evaluation found serious issues with the Government's contractor, including continuing problems with distribution through the 'pull' system, such as lengthy waiting periods after ordering medicines; packages delivered to the wrong addresses; inadequate communications; damaged supplies being delivered; and a general distrust for the efficacy of the entire medical supply system.

Availability of Essential Medicines

The evaluation found that overall measurement of availability, using the WHO-comparable indicator, of 16 tracer medicines in PNG was 64 per cent.

Overall, the health facility survey data showed that medicines supplemented by 'push' distributions of 100 per cent medical supply kits:

- Had approximately 50 per cent greater availability than Government of PNG 'pull' system medicines;

- Accounted for 79 per cent availability of 7 essential medicines at the rural aid post level, compared to only 25 per cent availability of 3 essential medicines distributed through Government of PNG 'pull' system;
- Accounted for 97 per cent of all amoxicillin supplies available in over 2,000 rural aid posts (essential for management of pneumonia, a major killer of children in PNG); and
- Directly contributed to almost 50 per cent reduction in amoxicillin stock-outs in 2012, which has been estimated to avert 416 child deaths due to pneumonia.

They also accounted for fewer expired medicines and were more likely to comprise generic medicines, but recorded similar durations of stock-outs when a stock-out did take place.

There were significant changes in overall stock-out rates between 2010 and 2012 for all eight medicines that were reported. Stock-out rates decreased for five medicines (Amoxicillin, Chloramphenicol, Cotrimoxazole, Oral Rehydration Salts, and Artemesinin-Combination Therapy). It is noted that these are all distributed within the 'push' system of 100 per cent medical supply kits (as well as the 'pull' system) or vertical malaria program. Stock-out rates were static for two medicines distributed only through the 'pull' system (medroxyprogesterone, oxytocin) and one kit medicine (ferrous sulphate / folic acid) that are essential to scheduled preventative services.

Rational Use of Medicines

DFAT acknowledges the evaluation findings that some contents were not used as planned (such as artesunate suppository and zinc tablets), and others were consumed more quickly than planned (such as common antibiotics and analgesics), however much of the over- or under-use was due to poor compliance with standard treatment guidelines rather than a mismatch of contents with population health needs. DFAT agrees that:

- Future quantification can be improved with attention to differential treatment roles at health centre and aid post levels, review of this survey's findings, supplementary operational research into medicines usage at health facilities, and efforts to improve rational use of medicines; and
- Further revision or supplementation of Standard Treatment Guidelines may be required to provide details of new medicines, dosing information to be more user-friendly (e.g. weight-based dosing schedules for children), and specific communication materials on generic/brand names of medicines.

DFAT notes feedback from some health managers regarding concerns that category C or D medicines such as morphine and ketamine were being made available at the health centre or aid post level, which was in conflict with current prescribing guidelines. No category C or D were supplied in the aid post kits, but limited category C (diazepam and morphine) were supplied in the health centre kits, on the rationale that they could be authorised by medical officers remotely by telephone or radio. Although DFAT was not responsible for the decision to including category C and D drugs in the health centre kits, these drugs were redirected from the health centres to the hospital levels in rounds 3 and 5 as a result of feedback from provinces and facilities. This feedback was provided to the NDoH and WHO to inform the contents of the 2014 kits.

Storage and Management of Medical Supplies

The evaluation found that overall conditions for storage and handling of medicines outside of formal hospital settings were inadequate, with only ~60 per cent of all health facilities having all the optimal storage and handling condition for medicines. DFAT agrees this is a fundamental issue and supports the evaluation's recommendations for Government of PNG reviewing medical supplies storage needs at health centres and aid posts, and incorporation of these into plans for new facilities, including Community Health Posts.

DFAT acknowledges concerns about the storage and handling of the kits which was raised by some staff and managers as an issue, citing reports of boxes delivered wet or damaged to a health facility. In all instances where failed deliveries, lack of delivery or general complaints are reported to DFAT, these are investigated and actioned as appropriate with sub-contractors and local authorities.

The evaluation team's overall conclusion is that while there are some irregularities that warrant monitoring and investigation, these are uncommon in the 100 per cent medical supply kits distribution.

Community Engagement

The evaluation reported predominantly positive or neutral responses from communities on the direct distribution of medical supply kits. A number of health facility staff noted a positive impact on improved community trust and confidence in health services from the 'push' system: "Biggest change is filling the gap when medicines run out due to delays and difficulties in getting supplies from Hagen. Community trust noticeable since started." (aid post, Highlands region). Health facility staff also suggested that expanded services meant fewer referrals, with savings in community time and cost: "…before the arrival of the kits they usually experience drug shortages so they have to buy at local markets. However, since the introduction of the kits it saves them money and provides the required treatment" (health sub-centre, Islands region).

Equity and Health Impact

The evaluation found that overall the kits program has contributed to improved equity in medicines availability. The evaluation measured equal availability of essential tracer medicines in high poverty districts and good penetration to health facilities designated as 'remote'. Their findings suggest that the kits ('push') system is likely to have contributed more, relative to the 'pull' system, to medicines availability in disadvantaged areas – demonstrated by 60 per cent availability of combined 'push' and 'pull' medicines in high poverty districts, compared to only 6 per cent availability when considering 'pull' system medicines in isolation.

Most qualitative data from interviews back up this finding, with many health facility staff reporting that a kit delivery has meant a new level of medicines availability in their facility; as well as a range of specific reports, one example being managers and staff in conflict-affected areas who noted the 'push' system option had made it easier to re-open closed rural facilities with more rapid re-commencement of services.

Although the kits program was found to increase medicine availability, the evaluation also highlighted instances where the push system had difficulty reaching some remote facilities. Liaison with provincial stakeholders, and monitoring by CKP and DFAT staff, identified the facilities where the round 1 and 2 kits were delayed due to remoteness. The distribution methods for these facilities were modified in later rounds to ensure deliveries were made as close to schedule as possible. However, although additional helicopter charters were approved by DFAT in the Momase region and other remote locations, delays were still unavoidable due to poor weather.

As demonstration of part of the potential impact of increased medicines availability, the evaluation modelled a possible coverage increase just in childhood pneumonia management as averting an extra 416 child deaths by 2013 compared to 2010, using the WHO Lives Saved Tool.

Transparency and Accountability

The evaluation's consultation with health managers reflect stories of abuse in both 'pull' and 'push' systems, including anecdotes where 100 per cent medical kits were delivered to incorrect sites, subjecting the supplies to potential theft or misuse. DFAT's response to these issues is address above under 'Distribution'.

The evaluation also notes that some managers and a few HF staff interviews reported that even though the 100 per cent kit medicines have been branded 'GoPNG-Not for Resale,' there have been credible reports of these medicines being sold on the streets and in unauthorized shops, with investigation by local authorities of these incidents underway. DFAT supports the evaluation's recommendation of the need for continuance of the stringent monitoring of all medical supply distribution that is currently a feature of 100 per cent medical supply kits contracting, and supports investigation by local authorities to ensure these medical supplies are used within public health facilities only.

DFAT’s response to the specific recommendations made in the report

DFAT’s responses to the sector-wide recommendations listed below reflect our views on their ongoing relevance to achieve the Government of PNG’s medical supply reform plan objectives. They do not specifically reflect Australian Government required actions or responsibilities. Although the Australian Government will not support distribution of medical supply kits during 2014-16 that have been procured through the current tender process, we intend to continue support to strengthening procurement systems (including establishing an independent health procurement authority), drug quality testing, rolling out a new electronic logistics management information system, and upgrading area medical stores.

Sector-Wide Recommendations	Response	Actions	Responsibility
From 2014, once the Government of PNG has reached a clear position on **governance structures**: **all agencies should work to strengthen transparency, value-for-money and an emphasis on quality assurance for health procurement structures, governance and institutional arrangements**; including the outsourcing of procurement and supply chain operations accompanied by more detailed and stringent contract and performance management in the ‘pull’ system (which may draw on some of the procedures developed under the recent kits distribution).	Agree	Government of PNG needs to officially decide on governance structures for health procurement and supply chain management; development partners need to support implementation of agreed institutional arrangements.	Government of PNG central agencies, NDoH, provincial governments and provincial health authorities and development partners
From 2014 over next three to five years: Government of PNG continue the ‘push’ system of kit distribution, with out-sourced distribution directly to facilities (including aid posts), to promote equitable coverage until the ‘pull’ system reaches agreed benchmarks for accurate needs-based supply.	Agree	Consultations with Government of PNG central agencies and provinces regarding direct distribution models and potential reclassification of functional assignment of responsibilities.	NDoH
From 2014 over next two years: quantification for both ‘push’ system distribution kits and the NDoH multi-year procurement plan should be enhanced by integrated estimates that maximize all available information: from vertical programs and Area Medical Store medicines usage records, the ‘pull’ system’s vital and essential medicines review, and new electronic logistics management information system data; *and* also be informed by rapid operational research (by WHO or another technical partner) into the full range of medicines usage and disease threats in a representative sample of health facilities. This may allow revision of the NDoH multi-year plan in two years’ time.	Agree	Operational research and implementation of eLMIS systems require continued support to provide quantification data to inform multi-year procurement plans.	NDoH, development partners

Sector-Wide Recommendations	Response	Actions	Responsibility
From 2014 over next three years: intensify support to other current medical supplies management reforms, as in the medical supply reform plan, particularly: expanded introduction of the electronic logistics management information system to regional Area Medical Store and pilot provincial locations; integration of distribution resources and systems across 'pull', 'push' and vertical programs; and expanded quality assurance staffing, equipment and procedures for whole of system monitoring.	Agree	Implementation of electronic logistics management information system systems and refurbishment of Area Medical Stores, introduction of distribution streamlining arrangements, and increased in external and in-country drug quality testing required.	NDoH, provincial governments and provincial health authorities, medical store management and development partners
From 2014: Support provincial and district involvement in management and quality improvement for both 'push' system kits deliveries and the handling of medical supplies in rural facilities through planning meetings of contractors and provincial/district managers prior to kit deliveries; and support stronger integrated supervision of medicines management and rational usage within provinces by increasing pharmacist and pharmacy technician positions and placements in provincial health agencies, including transit stores, as well as supporting existing district/provincial managers and/or Area Medical Store staff in supervision visits at health facilities.	Agree	Future distribution for push and pull systems to involve extensive consultation with provincial and district health managers; increased resourcing and support for pharmacy technical positions and placements and management supervision visits to health facilities.	NDoH, provincial governments and provincial health authorities and development partners
From 2014: continued commitment to evaluation, tracking progress and impact using the benchmarks in this first year's work, maintaining the academic partnership with UPNG (noting their benefits in capacity development and sustainability) and other technical partners, as well as review of findings in this report and the detailed recommendations below to inform program management. Consider review of the NHIS stock-out indicator.	Agree	DFAT will continue to financially support the multi-year impact evaluation of medical supply reform in partnership with PNG health stakeholders.	National Department of Health, UPNG, provincial governments and provincial health authorities and development partners