Tracking Expenditures on Public Procurement of Commodities for Child Health August 2005–January 2006

Jane Briggs
Naomi Brill
Katie Senauer
Melissa Thumm

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Rational Pharmaceutical Management Plus
Center for Pharmaceutical Management
Management Sciences for Health
4301 N. Fairfax Drive, Suite 400
Arlington, VA 22203 USA
Phone: 703-524-6575
Fax: 703-524-7898
E-mail: rpmplus@msh.org

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About RPM Plus

RPM Plus works in more than 20 developing and transitional countries to provide technical assistance to strengthen pharmaceutical and health commodity management systems. The program offers technical guidance and assists in strategy development and program implementation both in improving the availability of health commodities—pharmaceuticals, vaccines, supplies, and basic medical equipment—of assured quality for maternal and child health, HIV/AIDS, infectious diseases, and family planning, and in promoting the appropriate use of health commodities in the public and private sectors.

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CONTENTS

ACRONYMS

AIDS	acquired immunodeficiency syndrome
AQ	amodiaquine
ARI	acute respiratory infection
ART-LUM	artemether-lumefantrine
BCG	bacille Calmette-Guérin
CMS	Central Medical Stores
CTT	Commodities Tracking Tool
DFID	Department for International Development [UK]
DTaP	diphtheria, tetanus, acellular pertussis
EPI	Expanded Programme on Immunization [WHO]
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
HIV	human immunodeficiency virus
ITN	insecticide-treated net
MoH	Ministry of Health
MSH	Management Sciences for Health
NGO	nongovernmental organization
ORS	oral rehydration salts
PMNCH	Partnership for Maternal, Newborn & Child Health
RPM Plus	Rational Pharmaceutical Management Plus [Program]
SP	sulfadoxine-pyrimethamine
STGs	standard treatment guidelines
SWAp	sector-wide approach
UNICEF	United Nations Children's Fund
USAID	U. S. Agency for International Development
USD	U.S. dollar
WHO	World Health Organization

BACKGROUND

Many essential life-saving child and newborn care interventions depend on the availability of safe and assured quality medicines and health-related supplies.

In the public sector, these commodities are financed in part by governments through their Ministry of Health (MoH), with international donors, faith-based organizations, and the private sector contributing substantially to the remainder of the needs.

Tracking the expenditure on procurement of a selected list of child health commodities could provide an indication of the investment and, to some extent, the coverage of child health programs. This also could offer a proxy measure of country-level resource flows and commitments to essential child health services.

At the request of the Partnership for Maternal, Newborn & Child Health (PMNCH), Management Sciences for Health (MSH) Rational Pharmaceutical Management (RPM) Plus Program developed and tested a methodology for tracking the expenditure on public procurements of child health commodities. The methodology also assessed the ability of tracking expenditure on public procurement of commodities to serve as a proxy measure of expenditure or investment in child health. Two other pieces of research were also commissioned by the PMNCH—a child health sub-analysis of National Health Accounts by the World Health Organization (WHO) and U.S. Agency for International Development's (USAID) Partners for Health Reform Plus (PHR Plus), and an analysis of donor funds for child health programming by the London School of Hygiene and Tropical Medicine.

Methodology

A Commodities Tracking Tool (CTT) developed by MSH/RPM Plus, with funding from the Bill & Melinda Gates Foundation and the USAID to track pharmaceuticals and commodities procured for HIV/AIDS programs, was adapted and used to track funds expended on child health-related pharmaceuticals and other commodities in two countries: Country X in Africa and Country Y in Asia.

The tool tracked information received from the MoH on the quantity and value of commodities directly procured by the MoH or received through donation programs.

For the purpose of this exercise, information related to expenditures on public procurements of child health medicines and commodities by the MoH, central nonprofit procurement agencies, and multilateral, bilateral, and international donors over the previous three fiscal years (FY) 2002 to 2004 was collected from in-country records, and then entered and analyzed using the CTT. The commodity tracking exercise did not include information on donations received by nongovernmental organizations (NGOs) or on small-scale procurements made by NGOs not operating at national scale.

The indicators produced from the data included—

- Total amount in U.S. dollars (USD) spent on tracer child health commodities by year for three years in each country.
- Percent increase in tracer child health commodity expenditure over the three years.
- Ratio of MoH expenditure to aid donations in volume of child health commodities.
- Some additional analyses—for example, total expenditure per child—were also conducted. Several were performed using spreadsheets rather than the CTT as they were not part of the CTT reporting framework.

Parameters

A set of parameters, which were consistent with the other resource-tracking initiatives commissioned by the PMNCH, guided the tracking where appropriate. The parameters included—

- Focus on children under the age of five, including neonates
- Delivery of interventions only to children
- Prorate quantities of commodities or medicines used in other areas besides child health—the prorate is an estimate that takes into account population demographics, epidemiology, and expert estimates, and varies by item and by country
- Collect and analyze data on commodity expenditures from the public and nonprofit sectors only, and not from the private for-profit sector or from households

Tracer List

The tracked child health-related medicines and health commodities varied by country according to their respective national treatment guidelines. The tracer lists for each country included commodities which are essential for child health, such as vaccines, antimalarials, antibiotics, oral rehydration salts (ORS), and vitamin A. Expenditures on medicines specific to children (such as Vitamin A, antibiotic and antimalarial syrups, and ORS) were counted completely in the analysis, while expenditures on medicines also used by adults (for example, antibiotics or antimalarials in tablet form) were prorated for the percentage of the drug estimated to be used for children under five. The tracer lists and prorated estimates for each country are annexed to this report (Annexes 1 and 2).

Data Collection

A local consultant was identified in each country—both consultants were pharmacists well connected in the national drug management system who were able to retrieve the necessary information.

Three fiscal years were studied in both countries: July 2002–June 2003, July 2003–June 2004, and July 2004–June 2005. These years will be referred to as 2002, 2003, and 2004 throughout the report.

Information was collected for each tracer item on—

- Quantity of pharmaceutical or commodity procured
- Supplier/manufacturer
- Source country
- Source of funding, i.e., National MoH procurement, donation (of funds) or donation in kind (United Nation's Children's Fund [UNICEF] vaccines, mission sector drugs)
- Date/government fiscal year
- Invoice number
- Data source
- Cost of procurement, including unit price and extended costs (the rate of exchange for the three years was also recorded and used for USD conversion—there were no significant fluctuations in exchange rate in either country over the period of the study and so the same rate was used for all three years in each respective country)

In Country X, the information was obtained from the Medical Stores Agency, the Expanded Program on Immunization (EPI), and the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) office. Information was taken from purchase orders and invoices found in the procurement archives of the different sources. In Country Y, the information was accessed from a database of goods received notes, which are the support documents accompanying procurements at the central medical stores.

The study only covered information on pharmaceuticals received at central level and not on pharmaceuticals distributed; moving commodities to more peripheral levels or to specific targeted geographical areas or population groups was not examined.

The information from the two countries was retrieved and entered onto a spreadsheet (as in one country's copies of original invoices could not be made), which was then sent to the MSH Arlington, VA, office for entry into the CTT for analysis.

In Country X, sector wide approach (SWAp) funding was only introduced in mid-2005 which was after the study period. In Country Y, SWAp funding had been recently introduced, but the SWAp funds were not used for pharmaceutical procurements during the study period.

Prorating Expenditure

For those medicines or commodities that are used for adults and children, the total expenditures were prorated for the amount used by children under the age of five. The percentage of prorating was an estimate based on epidemiological data and expert opinion in each country. It was not possible in either country to obtain all the information necessary to calculate the prorate accurately, or to compare it to real experience or pediatric quantification data.

The prorate ratios were estimated separately for each of the countries and for specific items, based on the information available. They were applied consistently to the data for each of the three years in the respective countries to produce trends of expenditure over time. Applying the same ratios throughout allows for a comparison of annual expenditure *within* a country. Because a comparison of total expenditure *between* countries is not meaningful due to the different epidemiological profiles, population size, and health system and economic issues of the countries, the fact that prorating estimates for items were different between countries is not important. However, similar factors were considered when calculating the prorate ratios for each of the countries.

Challenges and Limitations

Procurement information is sensitive by nature and often not computerized or systematically archived. It was only through the use of well-connected consultants that the necessary information was accessible.

A tracer list was used, as it is impossible to capture all the commodities used for children. The focus was on medicines used at the primary health care level; however, it is recognized that hospitals are also an important and often more expensive source of commodities for children.

The data represents expenditure on commodities procured and received, and did not reflect real needs or actual orders or requests.

Time Frame

The methodology was finalized in August 2005. Consultants were identified and hired in September and October 2005. Data collection and entry was conducted in November and analysis was conducted in early December, with additional analysis conducted in January 2006.

FINDINGS

There was an increase in the expenditure on the procurement of commodities in the tracer list over the three fiscal years measured (2002, 2003, and 2004) in both countries (Table 1 and Table 2).

Table 1. Country X—Total Expenditures on Tracer Commodities by Year

Fiscal Year	Total Expenditures (USD)[1]	% Change from Previous Year
2002	2,490,203	n/a
2003	3,956,341	59
2004	18,879,626 with ITNs (4,396,450) without ITNs	377* (11)
TOTAL	**25,326,169**	

*The figure of USD 18,879,625 for FY 2005 includes USD 14,483,175 worth of procurements of ITNs by the GFATM. Without the nets included, there was an 11 percent increase from the previous year.

Table 2. Country Y—Total Expenditures on Tracer Commodities, by Year

Fiscal Year	Total Expenditures (USD)	% Change from Previous Year
2002	910,582	n/a
2003	1,498,476	65
2004	2,937,333	96
TOTAL	**5,346,391**	

Studying the ratio of government funds to donor funds used on procurement of the tracer items, it can be seen from the Country X data in Table 3 that, for the total three-year expenditure, the amount of donor funds used was four times greater than MoH funds. Note, however, that this is skewed by the procurement of USD 14,483,175 worth of ITNs by the GFATM; without the ITN procurement, a fairly equal amount was spent on procurement of the tracer commodities by both MoH and donors for all three years. In Country Y, a different profile was seen; total government expenditure on tracer commodities was double that spent by donor funds.

Table 3. MoH Expenditure Compared to Donations from Aid Sources in All Years[1]

	MoH Expenditure (USD)	Aid Donations (USD)	Ratio of MoH Expenditure to Aid Donations
Country X	5,213,271	20,112,897	0.26*
Country Y	3,614,666	1,731,724	2.09

*The aid donations for Country X include USD 14,483,175 in ITN purchases for FY 2005. Without the nets included, the ratio is 0.93

[1] Expenditure amounts in the tables and figures may differ slightly in total value because of the rounding of data to whole numbers.

The donor agencies involved in funding procurement of the tracer commodities in Country X were the World Bank, Global Alliance for Vaccines and Immunization, the GFATM, and the U.K. Department for International Development. The donor agencies in Country Y included the Japanese International Cooperation Agency, UNICEF, WHO, the World Bank, and others (unspecified).

Analyzing the MoH/donor split by year for each country (Tables 4 and 5) shows that, in general, donor funds as well as MoH funds used for procurement of the tracer child health commodities increased over the three year period. In Country Y, however, donor funds used for procurement in 2003 dropped by almost half, but then doubled the following year, while the MoH expenditure on the tracer commodities rose steadily with a nearly four-fold increase in 2003 and two-fold in 2004.

Table 4. MoH Expenditure Compared to Donations from Aid Sources by Year in Country X

Fiscal Year	MoH Expenditure (USD)	Aid Donations (USD)
2002	812,564	1,677,638
2003	1,644,966	2,311,375
2004	2,755,741	16,123,884*
TOTAL	**5,213,271**	**20,112,897**

*This figure includes the USD 14,483,175 net purchases through the GFATM. Without the nets included, the total spent through aid donations in 2005 was USD 1,640,709.

Table 5. MoH Expenditure Compared to Donations from Aid Sources by Year in Country Y

Fiscal Year	MoH Expenditure (USD)	Aid Donations (USD)
2002	309,866	600,715
2003	1,158,172	340,304
2004	2,146,628	790,705
TOTAL	**3,614,666**	**1,731,724**

These figures are shown graphically for each country in Figures 1 and 2.

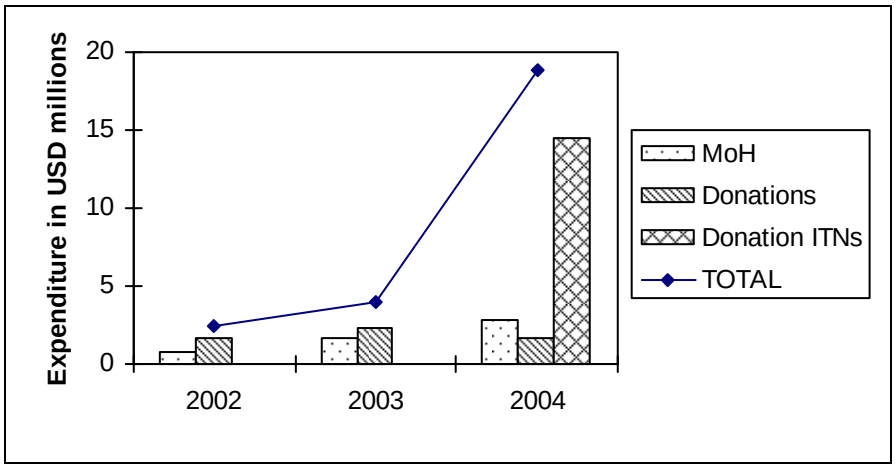

Figure 1. Expenditures of the MoH and Donors on Tracer Child Health Commodities over Three Years in Country X

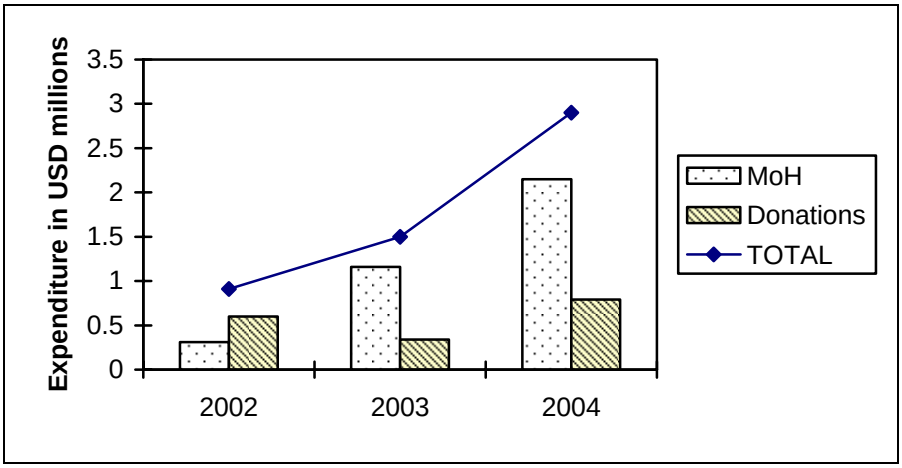

Figure 2. Expenditures of the MoH and Donors on Tracer Child Health Commodities over Three Years in Country Y

Types of Commodities

As highlighted by the donor expenditure on ITNs in Country X, particular commodities can skew the overall picture. It is therefore useful to analyze the procurements by types of commodities and to observe the trends over time. The total expenditure by commodity group in USD is shown in Tables 6 and 8. For a list of the medicines that constitute each commodity group, refer to Annex 3. As expected, antimalarials, antibiotics, vaccines, and ORS consistently make up a sizeable proportion of the expenditure in both countries with ITNs and malaria dipsticks representing a large portion in Country Y over all three years and in 2004 in Country X.

The expenditure on each group as a percentage of the total expenditure for each year is shown in Tables 7 and 9. From these tables, trends can be seen in the distribution of funding for each commodity group contributed by MoH and other aid donors. It was not possible to analyze this by individual donor using the CTT.

In both countries, there is a general trend that expenditure for commodity groups is not balanced equally between MoH and aid donations. Instead, it seems that MoH and donor funds are for the most part used to procure different types of commodities, particularly in Country X. For example, aid donations constitute the overwhelming percentage of total expenditure on vaccinations for both Country X and Y, while the MoH contribution accounted for nearly all of the total expenditure on antimalarials, micronutrients, and ORS in Country X and nearly all of the total expenditure for ITNs, dip sticks, and micronutrients in Country Y. In some cases, these proportions changed from year to year without a clear trend. For example, in Country Y, the MoH's contribution to the total expenditure on antibiotics increased from 89 percent in 2002 to 100 percent in 2003, but then fell to 56 percent in 2004.

Trends of further interest for specific drugs are shown in Figures 3–7.

Table 6. Total Expenditure (USD) by Commodity Group and by Year in Country X

Commodity Group	Expenditures (USD)			
	2002	2003	2004	Total
Antibiotics	509,814	646,055	621,087	1,776,956
Antimalarials	123,387	113,432	170,135	406,954
Micronutrients*	0	847	271	1,118
Vaccines	1,830,418	2,600,590	1,837,416	6,268,424
ITNs and dipsticks	0	0	14,483,175	14,483,175
ORS	0	347,797	1,411,189	1,758,986
Others	26,582	247,619	356,349	630,550

* During the three-year period, no Vitamin A was procured in Country X which contributes to the relatively small expenditures.

Table 7. MoH Expenditure Compared to Donor Expenditure as Percentage of Combined Expenditure by Year in Country X

Commodity Group	2002		2003		2004	
	MoH, %	Aid Donations, %	MoH, %	Aid Donations, %	MoH, %	Aid Donations,%
Antibiotics	15	85	100	0	99	1
Antimalarials	100	0	100	0	100	0
Micronutrients	0	0	100	0	100	0
Vaccines	32	68	11	89	11	89
ITNs and dipsticks	0	0	0	0	0	100*
ORS	0	0	100	0	99.98	0.08
Others	100	0	100	0	100	0

* The GFATM procurement of ITNs constitutes 100 percent of donor expenditure on ITNs and dipsticks.

Table 8. Total Expenditure (USD) by Commodity Group and by Year in Country Y

Commodity Group	Expenditures (USD)			
	2002	2003	2004	Total
Antibiotics	39,658	139,325	278,056	457,039
Antimalarials	141,209	402	194,630	336,241
Micronutrients	26,325	134,836	184,008	345,169
Vaccines	459,069	300,519	410,472	1,170,060
ITNs and dipsticks	36,706	344,646	944,070	1,325,422
ORS	86,129	40,713	397,328	524,170
Others	121,487	538,034	528,771	1,188,292

Table 9. MoH Expenditure Compared to Donor Expenditure as Percentage of Combined Expenditure by Year in Country Y

Commodity Group	2002		2003		2004	
	MoH, %	Aid Donations %	MoH, %	Aid Donations, %	MoH, %	Aid Donations, %
Antibiotics	89	11	100	0	56	44
Antimalarials	93	7	0	100	100	0
Micronutrients	66	34	84	16	86	14
Vaccines	0	100	0	100	7	93
ITNs and dipsticks	95	5	100	0	98	2
ORS	43	57	100	0	58	42
Others	44	56	97	3	86	14

Because it was beyond the scope of the present exercise, there is no qualitative information to explain some of the figures. For example, it is unclear why in Country X total expenditure on micronutrients was low, and specifically, no vitamin A was procured during the three years under study. We do not know if this was because there were sufficient supplies from previous procurements, or whether it was an oversight in the procurements.

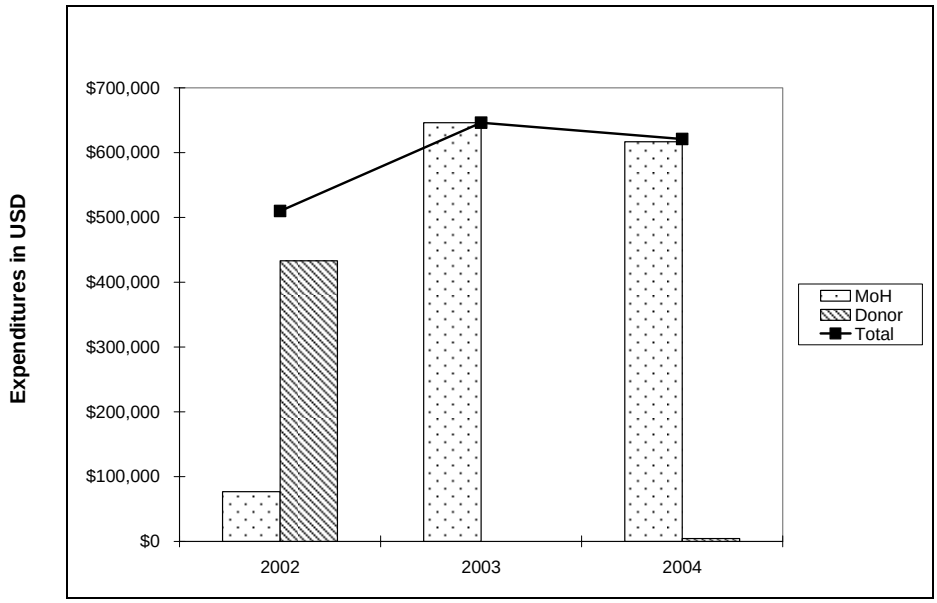

Figure 3. Expenditures of the MoH and Donors on Antibiotics over Three Years in Country X

Figure 3 illustrates the trend for antibiotic expenditure in Country X over three years. Aid donations accounted for a large percentage of total expenditure in 2002, but dropped severely in subsequent years while MoH expenditure increased significantly. In Country Y, a different trend is shown in Figure 4. MoH expenditure accounted for almost all expenditure on antibiotics in 2002 and 2003, but in 2004, aid donations increased while MoH expenditure remained relatively constant, substantially increasing the total expenditure in 2004.

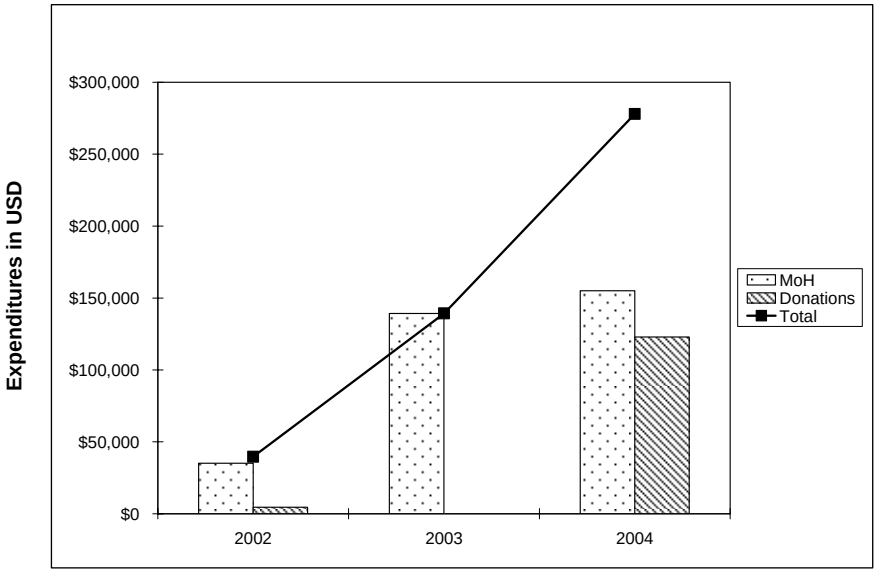

Figure 4. Expenditures of the MoH and Donors on Antibiotics over Three Years in Country Y

MoH expenditure accounted for the overwhelming majority of total expenditure on antimalarials in both countries over the three years studied in Country X, all procurement of antimalarials was funded by the MoH, and the amount stayed more or less constant over the three years. In Country Y, a severe drop in total antimalarial expenditure is seen from 2002 to 2003 (Figure 5). The reason for the large decrease from USD 141,209 to USD 402 is not known; it may have been due to a large procurement in 2002, which was sufficient for the subsequent year as well. Also of note is that the MoH entirely funded the procurements of antimalarials in 2002 and 2004, whereas the very small procurement in 2003 was donor-funded.

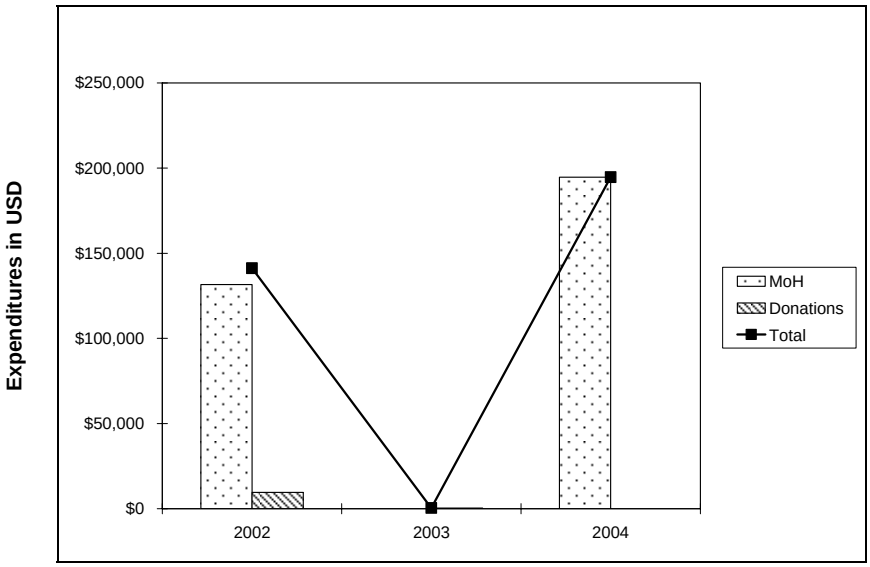

Figure 5. Expenditures of the MoH and Donors on Antimalarials over Three Years in Country Y

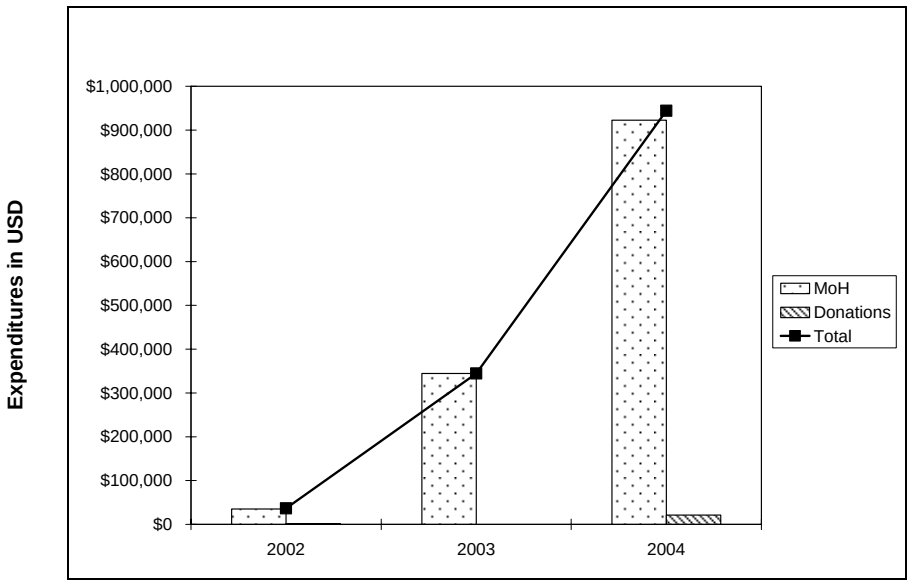

Figure 6. Expenditures of the MoH and Donors on ITNs and Dipsticks over Three Years in Country Y

Figure 6 illustrates the relative contributions of the MoH and donors to ITNs and dipsticks in Country Y. The MoH was responsible for nearly all of the expenditure on these commodities over the three-year period and increased substantially each year, resulting in a nearly 25-fold increase from 2002 to 2004. Aid donations contributed only 5 percent in 2002, dropping to zero percent in 2003, and increasingly slightly to 2 percent in 2004.

Conversely, no ITNs were purchased in Country X until 2004 when the GFATM financed the entire procurement of ITNs with USD 14 million, skewing the donor contribution to the overall procurement expenditure.

Figure 7 illustrates the more balanced profile of ORS expenditure by MoH and donors in Country Y, compared to some of the other commodity groups. The total expenditure on ORS in Country Y dropped in 2002 due to the lack of donor contribution, but then increased greatly again in 2004 with greater contributions from both the MoH and donors.

ORS procurement in Country X also increased almost four-fold over the three years but this procurement was entirely funded by the MoH.

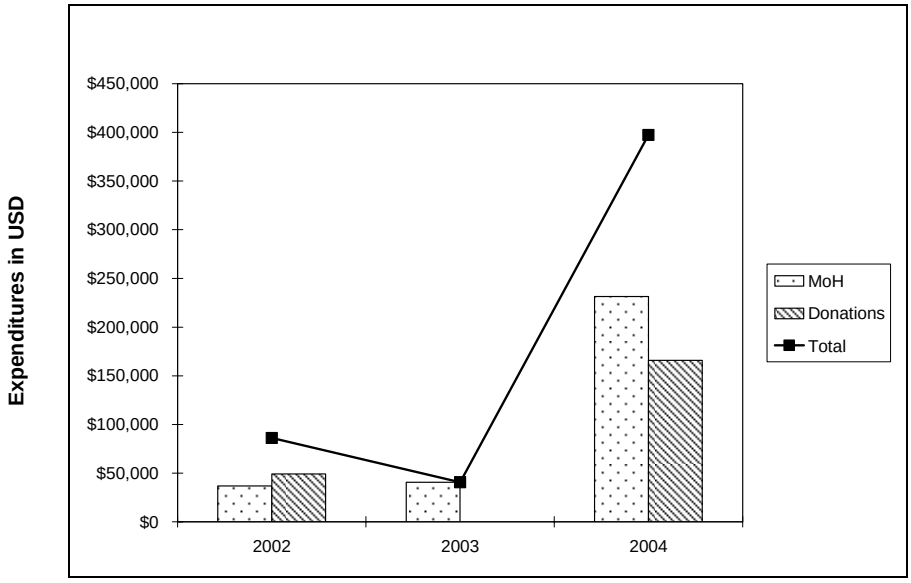

Figure 7. Expenditures of the MoH and Donors on ORS over Three Years in Country Y

Volume of Commodities

In addition to USD value of procurement, volume data were also collected during the exercise. In an analysis of expenditure over time, it is important to note the volumes of commodities procured, as there can be a greater expenditure when a smaller quantity of more expensive commodities is procured. This is critical when treatment policies change and new commodities are introduced during the tracking period; for example, in the case of new artemisinin-based combinations for malaria treatment (ACT), which are significantly more expensive than the older

generation of malaria treatments. If the treatment changed over the tracking period it would be important to study volume of commodities rather than expenditure to be consistent in the analysis for that commodity group. Country X introduced ACT after the study period and country Y was using ACT before the study period and so the same drugs for malaria treatment (all included in the tracer list for study) were being procured throughout the study period so no volume analysis was needed.

Expenditure per Child

For each country the expenditure on public procurement of tracer child health commodities per child under 5 was calculated. This may be a more useful indicator to track than total expenditure, as it can be compared between countries as well as over time. In both countries, there was an increase in the expenditure per child on the procurement of commodities on the tracer list over the three year period as shown in Table 10. The expenditure per child in the two countries was similar in both 2002 and 2003, but diverged in 2004 when expenditure per child increased more in Country X than Country Y on account of the GFATM's large procurement of ITNs.

Table 10. Expenditure per Child in USD by Year*

Fiscal Year	Country X	Country Y
2002	0.54	0.44
2003	0.85	0.71
2004	3.39 (0.79)**	1.63
Average	1.72 (0.72)	1.24

*The populations used for these calculations were from the *State of the World's Children* reports for the respective years 2004 (for 2002), 2005 (for 2003), 2006 (for 2004).

It may be useful to compare the commodities expenditure data with burden of disease or child mortality in order to assess whether trends in mortality are reflected in trends in expenditure on commodities. For the three year period covered by this exercise, however, this was not a useful analysis as it is difficult to determine trends over such a short period of time. Nevertheless, it is of interest to note the mortality rates for the countries shown in Table 11.

Table 11. Under Age Five Mortality Rate* for Countries X and Y for the Three Study Years**

Fiscal Year	Country X	Country Y
2002	122	138
2003	123	140
2004	120	141

***** Rate per 1,000
******Source: UNICEF. 2004, 2005, 2006. *State of the World's Children* Report.

Another important consideration when interpreting expenditure on public procurement of health-related commodities per capita is that, in many countries, out-of-pocket payments represent a large proportion of health expenditure, especially on pharmaceuticals, and this is not captured in this analysis of public procurement. In Country Y, out-of-pocket expenditure is high, accounting for approximately 73 percent of the total health expenditure for the country, or USD 24 per capita according to the MoH. In contrast, Country X has a relatively low out-of-pocket expenditure at 45 percent of the total health expenditure or USD 8.64 per capita, according to the MoH.

The observations presented in this report should be placed in the context of the specific countries. In Country Y, lower expenditures on commodities by the MoH and donors may be compensated for by the users' high out-of-pocket payments. But in Country X, with its low out-of-pocket expenditure, lower expenditures on commodities by the MoH and other aid donors may have deeper implications for the access and availability of those commodities for the users.

CONCLUSIONS

It was possible to collect and analyze data from the two selected countries on national procurement expenditure of a set of tracer child health commodities. The analyzed data was used to study the trends in terms of total expenditure, expenditure attributable to MoH and aid donations, expenditure on types of commodities, as well as expenditure on public procurement per child under the age of five. The exercise was feasible also in terms of budget, as the main cost elements were staff time to collect and analyze the data; one mid-level consultant was hired for a 20 day period in each country and two full-time RPM Plus staff worked on the analysis and report over a period of about two weeks.

Total expenditure on national procurement of tracer child health commodities in the two countries has increased over the three years studied. Both the donor and MoH contributions to overall expenditure on procurements of the tracer items increased in most of the years studied. Donor and aid agencies' contributions are critical as they finance a large portion of the expenditure.

A ratio of expenditure per child on public procurement of child health commodities relates somewhat to need in the population, and thus allows for some comparability. However, a more accurate comparison would be with utilization or coverage of health services.

It was not possible to determine whether expenditure on public procurement of a subset of child health commodities could be a proxy for general public expenditure on child health. We had hoped that a comparison could have been made with a child health sub-analysis of national health accounts in one country, but this was not possible as the researchers were not able to conduct the national health accounts analysis in that country. Even if it had been possible, it would not have proved that the analysis of expenditure on public procurements was a proxy for general public expenditure on child health, as one country comparison would not be sufficient to validate that.

It is expected that expenditure on public procurement of commodities alone will not be a good measure of public expenditure on child health, as there are many other expenditures that comprise the delivery of health services for children, such as human resources and other operating and administrative costs. The numerous large procurements of commodities, including ITNs, vaccines, and antimalarials that are being made in the current global climate also distort the measure as a proxy for expenditure on child health. A general limitation of measuring expenditure on procurement of commodities is that it does not account for a country's capacity to deliver services or what the quality of services will be.

Recommendations

The expenditure on public procurement of commodities may provide a means of tracking the resource flow for child health and the expenditure per child on public procurement of child health commodities is a useful ratio that can be monitored relatively easily. Although the

particular method used in this study was feasible in that data were available in the countries where it was piloted, it may not be the best method relative to the other two methods tested for the purpose of resource tracking for child health (sub-analysis of child health accounts and donor-funding analysis), particularly because it is unknown and questionable whether expenditure on commodities can be used as an effective proxy measure for investment in child health nationally or globally. It is felt that this analysis of expenditure on public procurement of child health commodities would be more useful to complement the child health sub-analysis of National Health accounts.

While the exercise is possible using Excel-type spreadsheets, future analyses of this type would require that some revisions be made to the software tool (CTT) in terms of its interface, list of medicines, entry of donors, and some of the analysis features to facilitate data entry and reflect the need of the child health analysis. Clearly, there are cost implications associated with this.

If this exercise is to be repeated, it is recommended that a standardized calculation or formula be used for the prorate ratios, or that the tracer commodities be limited to those that are used exclusively in children such as syrups and ORS.

ANNEX 1. TRACER LIST FOR COUNTRY X

Tracer item*	Prorate, %	Comments
1. Ambu bag		
2. Amodiaquine tablets 200 mg base	**20**	
3. Amodiaquine suspension 50 mg/5 ml		
4. Amoxicillin syrup 125 mg/5 ml		
5. Amoxycillin 250 mg tablets/capsules	**0**	Other therapeutic alternatives are available, e.g., cotrimoxazole, erythromycin, amoxycillin syrup
6. Benzylpenicillin 1 MU inj		
7. Cotrimoxazole 480 mg tablets	**7**	
8. Cotrimoxazole syrup 240 mg/5 ml		
9. Gentamicin injection 20 mg/2 ml		
10. Gentamicin injection 80 mg/2 ml	**0**	Because of existing therapeutic alternatives in cases where 20 mg/ml injection is not available
11. **Iron tablets**	**1.25**	
12. Folic acid tablets	**0**	MoH policy does not advocate for use of folic acid tablets on its own in children under the age of five
13. ITNs	**75**	Preferences given to parents with children under the age of five
14. Mebendazole 100 mg tablets		
15. Mebendazole suspension		
16. Metronidazole 200 mg tablet	**30**	
17. Metronidazole 200 mg/5ml syrup		
18. Nalidixic acid 500 mg tablets	**2**	Its usage is rare in children as it is recommended for use only in rare conditions, e.g., shigellosis—there are many other therapeutic alternatives such as metronidazole
19. ORS		
20. Paracetamol 500 mg tablets	**15**	
21. Paracetamol 120 mg/5 ml syrup		
22. Quinine injection 300 mg/ml	**10**	

Tracer item*	Prorate, %	Comments
23. **Quinine tablets 300 mg**	**0**	MoH policy does not advocate for use of Quinine 300 mg tablets in children < 5 years as there are alternatives, e.g., sulfadoxine-pyrimethamine
24. Quinine pediatric drops		
25. Sulfadoxine-pyrimethamine tablets 525 mg	**15**	
26. Vitamin A 100,000 IU		
27. Vaccine, bacille Calmette-Guérin (BCG)		
28. Vaccine, diphtheria, tetanus, pertussis, (DTaP)		
29. Vaccine, measles		
30. Vaccine, polio		

* Those drugs which are not in bold were not prorated as they are used only in children. Those drugs which are marked in bold were prorated by the percentage figure stated next to it. This is an estimate based on the assumptions listed below, although no exact formula was used for calculation. Specific prorating assumptions for Country X—

- National population = 30,000,000.
- Population under the age of five = 5,000,000 (17 percent of population).
- Public health facilities = 4,750 (i.e., 65 percent of all health facilities).
- Among children below the age of five, the dominant cause of hospital visits was due to: malaria (40 percent), URTI (pneumonia and other respiratory infections—12 percent), and anemia, accounting for about 70 percent of all hospital visits.
- More out-of-stocks of pediatric doses than adult doses. For instance, last year, amodiaquine tablets were out of stock for about three months compared with amodiaquine syrup which was out of stock for about six months.

The MoH policy is that if pediatric doses of certain medicines are lacking, then children must be given the appropriate solid doses of that drug. The health care workers must advise on the correct dosing.

ANNEX 2. TRACER LIST FOR COUNTRY Y

Tracer item*	Prorate	Comments
1. Ambu bag		
2. Ampicillin injection	**3**	
3. Amoxycillin 250 mg tablets/capsules	**10**	
4. Amoxicillin syrup 125 mg/5ml		
5. Artemether 80 mg ampules		
6. Artesunate 50 mg tablets	**1**	
7. Artesunate 100mg suppositories	**5**	
8. Benzylpenicillin injection 1 MU		
9. Chloroquine 150 mg base tablets	**10**	
10. Cotrimoxazole 480 mg tablets	**10**	
11. Cotrimoxazole pediatric 120mg tablets		
12. Cotrimoxazole syrup 240 mg/5 ml		
13. Ferrous/folate tablets	**30**	Used mainly in prenatal care and sometimes in children
14. Gentamicin injection 80 mg/2 ml	**3**	
15. ITNs	**80**	Depends on who sleeps under net, but usually the mother and children or pregnant women with the children
16. Malaria dipstick	**50**	More malaria episodes in children
17. Mebendazole 100 mg tablets		
18. Mebendazole 500 mg tablets		
19. Mefloquine 250 mg tablets	**5**	
20. Metronidazole 250 mg tablets	**10**	
21. Metronidazole 200 mg/5 ml syrup		
22. Nalidixic acid 500 mg tablets	**2**	
23. ORS		
24. Paracetamol 500 mg tablets	**10**	
25. Paracetamol 100 mg tablets		
26. Paracetamol syrup 120 mg/5 ml		

Tracer item*	Prorate	Comments
27. Quinine injection 300 mg/ml	**5**	
28. Quinine tablets 300 mg	**3**	
29. Tetracycline capsules 250 mg	**2**	
30. Tetracycline ophthalmic ointment	**30**	
31. Vaccine, BCG		
32. Vaccine, DPT		
33. Vaccine, measles		
34. Vaccine, polio		
35. Vitamin A 100,000 IU		
36. Vitamin A 200,000 IU		

* Those drugs which are not in bold were not prorated as they are used only in children. Those drugs which are marked in bold were prorated by the percentage stated next to it. This is an estimate based loosely on the assumptions listed below, but not using any figures to calculate.

Specific prorating assumptions for Country Y—

- 20 percent of the population under the age of five
- Acute respiratory infection (ARI), malaria, and diarrhea are more frequent conditions in children under five than in adults
- Percentage of use of public sector less than 50 percent
- Approximate number of episodes a year—3 of diarrhea, 1 of malaria, 1 of pneumonia
- Choice of other alternative medicines
- Use of drug in more than one condition (e.g., cotrimoxazole/amoxicillin for ARI and bloody diarrhea and possibly other infections in the under five years' age group)
- Fewer tablets make up a treatment course than in adults

ANNEX 3. COMPOSITION OF COMMODITY GROUPS FOR FURTHER ANALYSIS

Antibiotics

Ampicillin (500 mg) injection
Amoxicillin (250 mg) tablets
Amoxicillin (25 mg/ml) syrup
Cotrimoxazole (100+20 mg) tablets
Cotrimoxazole (200+40 mg/5ml) syrup
Cotrimoxazole (400 + 80 mg) tablets
Gentamicin sulfate (10 mg/ml) injection
Gentamicin sulfate (40 mg/ml) injection
Metronidazole (200-250 mg) tablet
Metronidazole (40 mg/ ml) syrup
Nalidixic Acid (500 MG) tablet
Penicillin, G Sodium 600 mg (1 MU) injection
Penicillin, G (0.4 MU) tablet
Tetracycline HCl (250 mg) tablet
Tetracycline HCl (1%) ophthalmic ointment

Antimalarials

Amodiaquine (150-200 mg) tablet
Amodiaquine (50mg/5ml) syrup
Artemether (100 mg/ml) injection
Artemether (80 mg/ml) injection
Artesunate (50 mg) tablet
Artesunate (50 mg) suppository
Artesunate (200 mg) suppository
Chloroquine Phosphate (base) (150 mg) tablet
Mefloquine (250 mg) tablet
Quinine sulfate (300 mg) tablet
Quinine dihydrochloride (250-300 mg/ml) injection
Quinine (200 mg/ml) pediatric drops
Sulfadoxine-pyrimethamine (500+25 mg) tablet

Micronutrients

Folic acid (1 mg) tablet
Ferrous salt iron=60 mg (200-300 mg) tablet
Vitamin A Retinol (200,000 IU) (60 mg) tablet
Vitamin A Retinol (100,000 IU) (30 mg) tablet

Vaccines

Vaccine,DPaT
Vaccine, measles
Vaccine, polio oral
Vaccine, BCG Dried

ITNs and dipsticks

Test, Malaria *P.Faciparum*, Paracheck
mosquiton net

ORS

Oral rehydration salts (1 PKT/1 L)

Others

Paracetamol (100 mg) tablet
Paracetamol (24 mg/ml) syrup
Paracetamol (500 MG) tablet
Paracetamol (100 mg/ml) syrup
Mebendazole (100 mg) tablet
Mebendazole (500 MG) tablet
Mebendazole (20 mg/ml) syrup