Tracking financial flows for immunization in Honduras

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15 ABSTRACT

16 *Introduction:* In Honduras, until 2008, vaccine and injection supplies were financed with
17 domestic resources. With the introduction of rotavirus vaccine in 2009 and pneumococcal
18 conjugate in 2011, the country's Expanded Programme on Immunization required an influx of
19 resources to support not only vaccine procurement but also investments in cold chain
20 infrastructure and programmatic strategies. This paper examines the origin, allocation, and use of
21 resources for immunization in 2011 in Honduras, with the aim of identifying gaps in financing.

22 *Methods:* An adaptation of the System of Health Accounts (2011) codes was used to specifically
23 track resources for immunization services in Honduras for 2011. All financial flows were entered
24 into an Excel database, and each transfer of resources was coded with a financing source and a
25 financing agent. These codes were then distributed by provider, health care function (activity),
26 health care provision (line item or resource input), and beneficiary (geographic, population, and
27 antigen). All costs were calculated in 2011 United States dollars.

28 *Results:* In 2011, financing for routine immunization in Honduras amounted to US\$ 49.1 million,
29 which is equal to 3.3% of the total health spending of US\$ 1.49 billion and 0.29% of the GDP.
30 Of the total financing, 64% originate from domestic sources. The other 36% is external
31 financing, most importantly Gavi support for introducing new vaccines. This analysis identified
32 potential financing gaps for many immunization-related activities besides procuring vaccines,
33 such as expanding the cold chain, training, social mobilization, information systems, and
34 research.

35 *Conclusions:* The funding for Honduras' immunization program is a small share of total public
36 spending on health. However, new vaccines recently added to the schedule with financial support

37 from Gavi have increased the financing requirements by more than 30% in comparison to 2008.
38 The Honduran government and its partners are developing sustainability plans to cover a
39 financing gap that will occur when the country graduates from Gavi support in 2016. Access to
40 lower vaccine prices will make the existing and future program, including the planned
41 introduction of HPV vaccine to adolescent girls, more affordable.

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44 *Keywords:*

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46 Financial flows

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52 **1. Introduction**

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54 Immunization is widely regarded as providing one of the best returns on investment in
55 public health. Nevertheless, the resource needs and, as a result, spending for national
56 immunization programs have grown in Honduras and other countries of Latin America. This is
57 primarily due to the introduction of new, more expensive vaccines, as well as the expansion of
58 the populations benefiting from these vaccines. Established in 1979, Honduras' Expanded
59 Program on Immunization (EPI) has rapidly grown both in terms of the number of vaccines
60 offered in the program as well as the related costs to deliver these vaccines. With financial
61 support from the Gavi, the rotavirus vaccine was introduced in 2009, followed by the
62 pneumococcal vaccine in 2011. Currently, Honduras is considering the introduction of HPV
63 vaccine, which would further increase total financing needs for the program.

64 In 2011, the national health expenditure amounted to US\$ 1.49 billion, representing a per
65 capita expenditure of US\$ 182 (**Table 1**). As elsewhere in Latin American and the Caribbean, in
66 Honduras the government has set out to secure domestic financing to support immunization
67 services in order to build a sustainable program in both the short and medium term. The new,
68 more expensive vaccines provide substantial health benefits. However, their higher costs and the
69 reliance on external aid to introduce them make it imperative to carefully track immunization
70 resources. This study aims to map the financial and commodity flows that support immunization
71 services in Honduras. An accurate understanding of the resource flows and available financing
72 for immunization services in a country such as Honduras could empower decisionmakers and
73 planners with information to improve resource allocation and to mobilize funds needed to fill

gaps. The country is currently developing sustainability plans in preparation for its graduation in 2016 from Gavi subsidies for the pneumococcal conjugate and rotavirus vaccines. Graduation from Gavi support occurs after a country has surpassed the eligibility criteria of <US\$ 1500 per capita GDP.

2. Methods

2.1. Conceptual framework and accounting method

Resource tracking is a real-time planning and evaluation tool to understand and assess the flow of resources for health (and, in this case, immunization services) aimed at reaching end users in a country [1]. A more precise description and understanding of these resource flows enables a management team to demonstrate their good stewardship of both domestic and external funding sources as well as to identify any overlap and/or inefficiencies. Additionally, these methods may point to funding gaps and to reasons to support resource mobilization efforts. This analysis focuses on the flow of financing and commodities for the routine immunization program from external, government, and other domestic sources. Following the EPIc Common Approach [2], this analysis adapted the System Health Accounts [3] coding methods for tracking financial flows to the context of immunization delivery. This coding system facilitates the identification and categorization of various financing sources, agents, and schemes that subsequently can be distributed between different health care providers, health care functions (similar to EPI planning components or activities) [4] health care provisions (similar to line item classifications), and

ultimately beneficiaries by vaccine type and/or region [3,5]. **Figure 1** shows the relationship between the different transactional vector categories.

All financial flows identified for the fiscal year 2010/2011 were quantified and coded. This 12-month period began 1 January 2011 and extended to 31 December 2011. EPI financing was evaluated at the national, regional, and local levels. Financing at the local level was, in part, estimated through a survey conducted in a representative sample of health units. More information regarding the sample of health units is described in a companion analysis of costs published in this issue [4]. Information from bilateral and multilateral agencies that provided some type of support to the immunization program, whether in cash or in kind, was also included in the study. Donations in kind were recorded through the use of local appraisals. For example, Project HOPE donated approximately 150,000 doses of the 23-valent polysaccharide (PPV23) vaccine for special risk groups. In this case, the market value of the doses (US\$ 17.63 per dose) was considered and subsequently recorded as a financial flow.

The accrual accounting method was used for this study, which refers to identifying all financial transactions or committed budgets that have been transferred in the period in which the value of a good or service was generated [5]. All financial flows were estimated in the local currency, lempiras, and converted to 2011 US dollars at the official exchange rate of 18.8915 lempiras to US\$ 1.00. Administrative records from public, private, and foreign institutions were obtained to estimate the total financing amount transferred. In the event that financial records were not adequately detailed to ascertain allocation of the financing source, agent, and scheme to health provider, health care function, health care provision, and beneficiaries, several allocation rules were assumed:

- Health providers (HP), region (REG), vaccine (VAC), target population (POP): Financing records do not provide information to code directly for health provider type, region, vaccine, or target population. As such, the total 2011 financing for immunization was allocated to each of these categories based on the proportion of doses applied by category.
- Factors of health care provision (FP): Most financing records provide sufficient information to classify the transaction by FP. In the event of insufficient information on the record to inform the allocation by FP, records from other institutions with similar expense detail were used to apply an assumption regarding the FP.

Additionally, another series of allocation rules were derived from the facility-based survey that was implemented primarily for the analysis of the cost of delivering routine immunization in Honduras [4]. Financing for Ministry of Health (MoH) staff 100% dedicated to immunization services was easily identifiable in the staff roster. However, staff that share time between immunization services and other public health services were identified in the facility-based sample, and the extrapolations of these costs to the whole country were used. Also, some financing for vehicles, meetings, per diems, and travel allowances at the local level was identified in the facility-based survey.

2.2. Data collection

Several data sources were consulted to identify, quantify, and correctly code all financial flows. Through key-informant interviews, primarily with the immunization program

management and key actors in financial management at the Honduran MoH, a mapping exercise was conducted to better understand all potential financial sources and actors in the flow of resources for immunization in the country. With each of the institutions identified in the mapping exercise, in-person interviews and official letters were used to solicit information. Additionally, some facility-level financial sources and flows were identified in the facility-based survey administered primarily for the cost analysis [4].

Specifically, the MoH provided information on payroll, inventories, financial records, and national statistics, among others, at the central and regional administrative levels. The national payroll database provided a listing of all MoH staff dedicating some or all of their work time to immunization services. This database identified the financing source for each employee. The cold chain inventory listing was obtained to determine information on all equipment acquired in 2011, including the location, brand, model, series, operational use, condition, replacement cost, and financing source. A secondary source for equipment information was the national inventory of assets listing, which details all goods and property of the MoH that support immunization services. Vehicles procured in 2011 were identified in this listing. Next, financial transaction records (“F01 forms”) were obtained from the MoH budget office to identify, quantify, and code many financial flows related to vaccines, supplies, per diems, travel allowances, and other transfers. This form reports the line item detail, including intended use (activity or health care provision), executing unit, accounting period, financing source, financing agent, and total amount transferred. Finally, national statistics on production (doses applied) by health facility, municipality, region, sector, and antigen were obtained from the National Statistics Bureau. The MoH Management, Planning, and Evaluation Unit provided information on financing from international cooperation partners, including Gavi. Information regarding

financing from the U.S. Agency for International Development (USAID) and the Spanish Agency for International Development and Cooperation (AECID) was obtained from the Extending Coverage and Financing Unit in the MoH.

The Ministry of Finance (MoF) provided additional health-related F01 forms detailing financial transactions at the lower administrative levels. The Honduran Social Security Institute provided information on vaccination statistics (doses applied) and payroll. Finally, information was gathered from international organizations to track all resource flows originating outside of the country. PAHO, UNICEF, Gavi, and other multilateral and bilateral organizations as well as NGOs and foundations contributed information regarding their financing of immunization services in Honduras. For example, PAHO provided all purchase invoices for vaccines and other supplies procured through the PAHO Revolving Fund. These invoices detail vaccine prices, quantity, administrative fees, freight, and insurance for each purchase order.

3. Results

In 2011, an estimated US\$ 49.1 million in financing was identified for immunization services in Honduras. This equaled 3.3% of total national health expenditures and 0.29% of the GDP. **Figure 2** details the 2011 financial flows for routine immunization services in Honduras. The mapping of financial flows led to a systematic approach for identifying and quantifying financing from its origin to its intended beneficiary, grouped by region, antigen, and target population. The direction of resource flows among the financing sources, agents, providers, and ultimately beneficiaries is shown by the directional arrows in **Figure 2**.

An estimated 64% of total financing for immunization services originated from domestic revenue schemes, principally taxes and royalties on public and private companies and/or households. External financing (i.e. donations, loans, direct foreign investment) for immunization amounted to 36%, primarily from donations (21% of the total financing) and loans (7% of the total financing). GAVI Alliance financial transfers accounted for 17.8% of total financing.

The financing sources for immunization included the central government, public and private employers, households, and international cooperation. These sources were then channeled to the financing agents responsible for allocating the resources to the intended provider. All external financing was redirected to the MoH as the financing agent, at the central, regional, or municipal level.

The EPI, in conjunction with upper leadership at the MoH, makes resource allocation decisions as an important financing agent for all immunization services. This agent allocates resources to the service provider level, including all public, social security, and private clinics providing immunization services. Public sector clinics provided 94.5% of the vaccinations in 2011, and they received about 93% of the total available financing for immunization. Of the total financing, 21.8% supported PCV13 vaccinations, with the next largest shares going to influenza (13.4%), pentavalent (12.8%), and rotavirus (12.6%). Finally, financing tagged for beneficiaries is most importantly targeted at those under 1 year old (53%).

Crossing the financing agent codes and the financing source codes demonstrates the critical role the government plays in financing and administering financial flows for use in the immunization program (**Table 2**). By far, the MoH manages and administers the single largest share (67%) of all the financing. At the regional and local government level, a smaller but

substantial amount of domestic revenues is managed and administered, approximately US\$ 11.1 million or 22% of total financing. Some PAHO resources are directly transferred to the local level, totaling approximately US\$ 300,000. This financing is likely earmarked for per diems and travel allowances to mobilize outreach efforts in low-coverage districts. Finally, it is important to note that most other external financing aimed at supporting immunization services in Honduras is earmarked for vaccine and supply purchases. These purchases are executed at the central level; therefore, most financing of external origin, for example Gavi financing, is centralized.

The matrix in **Table 3** shows how various financing sources contribute to different inputs (i.e. Factors of provision (FP)) to the national immunization program. Again, we can see that the government finances approximately two-thirds of the program. The central government primarily finances wages and other employee benefits, including per diems and travel allowances. In contrast, the regional governments finance all vaccines (for both children and other risk groups) as well as the majority of the cold chain equipment acquired in 2011. This finding is of interest because procurement for vaccines and supplies is centralized, while the available financing is located in decentralized accounts. The third largest source of financing is from Gavi, which exclusively finances new childhood vaccines (PCV13 and rotavirus), injection supplies, and a small amount of per diem and travel allowances as well as printing. Loans from international organization, mostly originating from agreements related to the country's status as a heavily indebted poor country (HIPC), finance wages for health workers at the regional level and facility level, as well as safety boxes and some cold chain equipment.

4. Discussion

Throughout the 2000s, Honduras' immunization program relied little on external financing to meet the program's targets (WHO/UNICEF JRF). However, external financing for routine immunization services, primarily from the Gavi, increased from 7.3% in 2008 to 25% in 2009 and 57% in 2010 (**Figure 3**). With Gavi and PAHO support, rotavirus vaccine was first procured in 2009, and PCV13 at the end of 2010. Additionally, WHO donated pandemic A(H1N1) influenza vaccine to the country during this period.

Despite a decreasing overall share of total financing originating from domestic sources for immunization services, the government of Honduras has increased the fiscal space available for vaccine purchase and strengthening of the routine program in recent years. Legislation first enacted in 1998 has earmarked up to 2% of the budget assigned to the MoH for vaccine and supply procurement. From 2005 to 2008, the budget approved for immunization more than doubled. Both 2007 and 2008 represent atypical years, when a policy change extended routine seasonal flu vaccination to new risk groups, including pregnant women and the elderly, and the country launched a massive measles and rubella follow-up campaign to maintain the country free of susceptible persons.

Gavi has provided financing to the EPI since 2004. Through 2010, Honduras received US\$ 9.7 million in support for injection safety, for generalized strengthening of immunization services and of the health system more broadly, and for new vaccine introduction, primarily rotavirus. More than 80% of this Gavi support has been directed towards the procurement of new vaccines. In 2011, Gavi financing for immunization in Honduras totaled US\$ 8.7 million, an amount that was nearly double the total financing during the preceding six years. The hike in

financing supported the universal introduction of PCV13, the most expensive vaccine in the routine program, as well as efforts to strengthen the immunization information system, including the purchase of computers for the regional level to begin implementing a computerized nominal registry system.

Support from donor partners, particularly Gavi, has strengthened the government's financial capacity to incorporate new vaccines, leading to substantial health gains for children in Honduras. However, Gavi subsidies will expire in 2016, and the government will be fully responsible for paying for the new vaccines, though at a negotiated, greatly reduced price. In addition to gaps in financing of new vaccines, there are other important funding shortfalls (**Table 4**) that need to be more closely assessed for near-term resource mobilization efforts and planning. Domestic resources will need to replace the external sources soon.

For 2011, the EPI reported approximately US\$ 21.3 million in expenditures [6]. Vaccine and supply purchases represented over 80% of this amount. This reported expenditure figure only represents the budget managed and executed by the central EPI management, which generally would cover vaccine and supply procurement via the PAHO Revolving Fund as well as training, other meetings, and employee wages and benefits for the management team. Still, this figure does not clarify important and real financing gaps for the same year. The program had received a budget approval in the amount of US\$ 25 million. Due to unforeseen revisions to the committed budget (which was financed from both domestic and external resources), the program suffered a financing gap just under US\$ 4 million for the same year. This shortfall most severely impacted the acquisition of needed cold chain equipment and vehicles. Nonetheless, the program successfully rolled out the PCV13 vaccine and met nationwide targets for completing childhood vaccination schedules during the two annual national vaccination weeks. Still, many districts

suffered from lower coverage in 2011 than in previous years. Further, these financing gaps, particularly for general operations and transport, put the program's operational capacity at serious risk.

Under its Gavi incremental co-financing payment agreement, Honduras' obligation per dose for PCV13 will go from US\$ 0.17 in 2011 to US\$ 2.17 in 2014. This is a useful mechanism to begin transitioning towards more sustainable, domestic financing streams. However, financing gaps for operational activities, such as transport and cold chain maintenance, may widen because of the government's increased financing responsibility for the new vaccines. In the near and long term, the government's primary strategy to ensure sustainability and to maintain the great progress the program has made in reducing vaccine-preventable diseases is tied to securing 100% of immunization financing from domestic sources. This will be achieved with the commitment of the central government and subnational governments by allocating greater resources, raising existing taxes on some products, and/or imposing new taxes on other products. In 2013, the National Congress of Honduras passed a law earmarking increased domestic funding for immunization services. The new legislation included language to protect financing for general strengthening of the program as well as to procure vaccines and supplies. This law has yet to be published in the official legislative gazette, but this new legislative framework will help secure increased funding that will sustain both vaccine procurement and programmatic strengthening.

5. Conclusion

The cost of Honduras' EPI makes up a small share of the public spending on health. However, new vaccines recently added to the schedule with financial support from Gavi have increased program costs more than 30%. The Honduran government and its partners need to prepare to cover a future financing gap when the country graduates from Gavi support in 2016. Access to lower vaccine prices will make the existing and future program, including the planned introduction of HPV vaccine to adolescent girls, more affordable in the near and long term.

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Table 1. Health, economic and demographic indicators for Honduras

Indicator	
Total population	8,215,313
Expected births	177.733
Women of childbearing age	2,135,981
Infant mortality rate	24.3
GDP per capita (US\$ at current prices)	2156
National health expenditure (million US\$)	1494
Public expenditure on health	48.1%
Private expenditure on health	51.9%
Health expenditure per capita (US\$)	181.8

Figure 1. System of Health Accounts (SHA) 2011 financing, production, and consumption codes

Figure 2. Mapping of immunization financing flows in Honduras, 2011

Table 2. Financing Agent (FA) by Financing Source (FS) for routine immunization, 2011

		FA 1.1.1	FA 1.2.1	FA 1.3.1	FA 3	FA 4	FA 5	FA 6	Tot
		Ministry of Health	Regional government	Social Health Insurance	Corporations	Nonprofit institutions serving households	Households	Rest of the world	Finan age
FS 1.1.1	Central government	\$ 19,757,049							\$ 19,7
FS 1.1.2	Regional government		\$ 11,139,747						\$ 11,1
FS 2.1.1.1	USAID	\$ 47,640							\$
FS 2.1.1.5	AECID	\$ 255,567							\$ 2
FS 2.1.2.3	PAHO	\$ 689,888	\$ 299,909						\$ 9
FS 2.1.2.1	UNICEF	\$ 57,171							\$
FS 2.1.3	GAVI	\$ 8,756,517							\$ 8,7
FS 3	Social insurance			\$ 553,996					\$ 5
FS 5	Voluntary prepayment						\$ 867,324		\$ 8
FS 6	Other domestic revenues				\$ 71,255	\$ 99,389			\$ 1
FS 7	Direct foreign transfers							\$ 2,966,657	\$ 2,9
FSR 1.1	Loans	\$ 3,498,562	\$ 22,956						\$ 3,5
Total Financing Source		\$ 33,062,396	\$ 11,462,611	\$ 553,996	\$ 71,255	\$ 99,389	\$ 867,324	\$ 2,966,657	\$ 49,0

Table 3. Financing Source (FS) by Health Care Provision (FP) for routine immunization, 2011

		FS 1.1.1	FS 1.1.2	FS 2.1.1	FS 2.1.2	FS 2.1.3	FS 3	FS 5	FS 6	FS 7	FSR 1	Total Financing Source
		Central government	Regional government	Bilateral organizations (USAID, AECID)	Multilateral organizations (PAHO, UNICEF)	GAVI	Social insurance	Voluntary pre-payment	Other domestic revenues	Direct foreign transfers	Loans	
FP 1.1	Wages	\$16,619,910				\$78,209	\$553,996		\$74,456		#####	\$20,555,398
FP 1.3.1	Per diem	\$345,398	\$485,033	\$74,051	\$530,067	\$122,665		\$779,753	\$54,167	\$122,781		\$2,513,914
FP 3.2.1.1.1	Other vaccines	\$11,566		\$11,857	\$16,473							\$39,897
FP 3.2.1.1.2	Childhood vaccines		\$176,837			\$13,051				\$7,759		\$197,647
FP 3.2.1.2	Other healthcare goods		\$100,150			\$45,749				\$5,648	\$22,956	\$174,503
FP 3.2.2.1	Injection supplies	\$111,282	\$178,972	\$4,235	\$12,948	\$48,121		\$53,623	\$15,930	\$20,353		\$445,463
FP 3.2.2.2	Other supplies	\$34,094	\$517,821	\$33,305				\$15,556		\$119,533		\$720,309
FP 3.3.1	Transport	\$10,322		\$49,406	\$22,488	\$10,778				\$7,975		\$100,969
FP 3.3.2	Maintenance		\$102,203	\$80,436	\$28,252	\$656			\$265	\$619		\$212,431

FP 3.3.3	Printing	\$ 33,078	\$ 45,895	\$ 35,382	\$ 12,041	\$ 17,364			\$ 7,242	\$ 6,839	\$ 157,840	
FP 3.3.4	Other non-healthcare services	\$ 34,829	\$ 1,570	\$ 9,157	\$ 5,943		\$ 18,391	\$ 25,825	\$ 2,010	\$ 64,812	\$ 162,537	
FP 3.4.1	Utilities and communications	\$ 109,557	\$ 680,884		\$ 12,228					\$ 198,085	\$ 1,000,754	
FP 3.4.2	Other non-healthcare goods				\$ 4,065	\$ 47,041					\$ 51,106	
FP 4.1	Cold chain equipment			\$ 5,378	\$ 61,125	\$ 37,341					\$ 103,845	
FP 4.2	Vehicles	\$ 2,447,014			\$ 1,116						\$ 2,448,130	
FP 4.3	Other equipment				\$ 340,221						\$ 340,221	
FP 5	Other items of spending on inputs		\$ 5,575,843			##### ##					\$ 13,911,386	
FP 99	Not disaggregated		\$ 3,274,539						\$ 2,672,738		\$ 5,947,277	
Total Factor Provision		\$19,757,049	##### ##	\$ 303,208	\$1,046,968	##### ##	\$553,996	\$867,324	\$ 170,643	\$ 2,966,657	##### #	\$ 49,083,626

Figure 3. % Financing of EPI by source (2001 – 2010)

Table 4. Domestic financing gaps by immunization activity in Honduras (2011)

Activity (Health Care Function)	Domestic financing	External financing
Social Mobilization	79.5%	20.5%
Facility-based vaccination	84.0%	16.0%
Outreach	82.4%	17.6%
Training	65.0%	35.0%
Vaccine and supplies	51.0%	49.0%
Cold chain	81.0%	19.0%
Supervision and Monitoring	75.5%	24.5%
Evaluation	52.7%	47.3%
Program management	84.7%	15.3%
Other operating costs	38.0%	62.0%
Surveillance	77.2%	22.8%
Information System	80.6%	19.4%
Priority Policy and Legal Basis	51.1%	48.9%
Research	96.4%	3.6%
TOTAL	66.2%	33.8%