

“More Health for Money” in Vietnam:
Does Operational Cost or Running Cost of Health Institutions Help
Budgeting for More Services and Improve the Health of the population?

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Abstract

This paper examines the correlation between cost of health facilities and population at provincial level in Vietnam. A major cause of the services quality and cost problems in health care today is that payment systems encourage volume-driven health care rather than value-driven health care. Under the current Vietnam health care payment systems, physicians, hospitals and other health care providers have strong financial incentives to contain cost, deliver more services to more people but are often financially penalized for providing better services and improving health. Research has shown that more services and higher spending do not result in better outcomes; indeed, they often produce exactly the opposite result. In order to fix the right price and use the right payment system, governments often look at producing costing studies, such as the cost of running a facility type, cost of services, cost of program and others. All kinds of costing can be adapted based on either the population size, number of patients or complexity of services delivered. This study linked cost (expenditures?) with population and assessed the impact of cost of service delivery, on the practice patterns of providers and its productivities in primary health care mainly at the provincial levels in Vietnam. The results support the notion that costing studies can only be regarded as a start point in considering wider issues of financing health care services and its management. Five provinces have been chosen for piloting their facilities at a primary care level. One of the findings shows that the reported activity levels in the public provider network are low when compared to other countries and international standards. This could reflect both inefficiencies and insufficiencies in the financial management structure of the facilities. Both cases will need to be rectified. If efforts do not lead to acceptable levels of service quantity and quality by population size, the cost of any expended resources would be high. A rectified costing system per capita that links population to providers' payment at provincial level would provide a better future financing model - for achieving Universal Health Coverage in Vietnam. Some risk adjustment and reward for health service productivity might be an added value and a viable alternative to current practices.

Key words: Facility Cost, Money for Health, Population Vis Cost, Provincial level, Vietnam

Introduction

The definition of Universal Health Coverage (UHC) from The World Health Report 2010 embodies one of the ultimate goals of health systems – financial protection – as well as intermediate objectives associated with improved health system performance: all people obtain the health services they need (i.e. equity in service use relative to need) and that these services are of sufficient quality to be effective¹.

The first aspect of Universal Health Coverage - use of needed quality service- corresponds closely to the concept of effective coverage, i.e. the probability that an individual will get an intervention that he needs and experience better health as a result². This concept can be disaggregated into the following elements:

- Reducing the gap in a country's population between the need for services and the use of those services, which implies that (i) all persons who need an intervention are aware of their need; and (ii) all persons who are aware of their need are able to use the services they require;
- Ensuring that services are of sufficient quality to increase the likelihood that they will improve (or promote, maintain, restore, etc., depending on the nature of the intervention) the health of those who use them.
- Ensuring that providers are paid sufficient amount to produce such services

Measuring effective coverage across all services and the entire health system is not feasible. To date, this has been done only in the case of individual health conditions and interventions, such as immunization coverage (e.g. a cross-country review)³ or hypertension control (e.g. in Kyrgyzstan)⁴; a specific set of interventions within one aspect of care, such as maternal and neonatal health interventions (e.g.in Nepal)⁵; or a wide but still limited set of interventions (e.g. in Mexico and China)⁶.

The World Health Report 2010 depicted three dimensions of coverage as the axes of a cube: population, service and cost. The population axis describes the UHC objective of population coverage with both

¹ The world health report – Health systems financing: the path to universal coverage. Geneva: World Health Organization; 2010.

² Shengelia B, Tandon A, Adams OBR, Murray CJL. Access, utilization, quality, and effective coverage: an integrated conceptual framework and measurement strategy. *Soc Sci Med* 2005; 61:97109. <http://dx.doi.org/10.1016/j.socscimed.2004.11.055> PMID:1584796

³ Lessler J, Metcalf CJE, Grais RF, Luquero FJ, Cummings DAT, Grenfell BT. Measuring the performance of vaccination programs using cross-sectional surveys: a likelihood framework and retrospective analysis. *PLoS Med* 2011;8:e1001110. <http://dx.doi.org/10.1371/journal.pmed.1001110> PMID:22039353

⁴ Jakab M, Lundeen E, Akkazieva B. Health system effectiveness in hypertension control in Kyrgyzstan. Bishkek: Center for Health System; 2007 (Policy Research Paper No. 44). Available from: http://www.hpac.kg/custom/download.php?title=Health+Systems+Effectiveness+in+Hypertension+Control+in+Kyrgyzstan&download=PR_P44.E.pdf [accessed 12 June 2015].

⁵ Pradhan YV, Upreti SR, Pratap KCN, KCA, Khadka N, Syed U et al.; Nepal Newborn Change and Future Analysis Group. Newborn survival in Nepal: a decade of change and future implications. *Health Policy Plan* 2012;27 Suppl3;iii57-71. <http://dx.doi.org/10.1093/heapol/czs052> PMID:22692416

⁶ Lozano R, Soliz P, Gakidou E, Abbott-Klafter J, Feehan DM, Vidal C et al. Benchmarking of performance of Mexican states with effective coverage. *Lancet* 2006;368:172941. [http://dx.doi.org/10.1016/S0140-6736\(06\)69566-4](http://dx.doi.org/10.1016/S0140-6736(06)69566-4) PMID:17098091

services and financial protection. The cost coverage axis is critical to the financial protection objective, although it still needs to be interpreted with regard to population size and capacity to pay. And by defining the service coverage axis in terms of needed and effective services, this dimension captures the objectives of ensuring that everyone is able to use the health services that they need and that these services are of good quality. These three dimensions connect closely to health care providers as well as to health financing policies related to achieving UHC in the country.

In theory, financing a health care institution is related to its total cost which the institution can then use to request more or less funds from the ministry of finance. The Ministry then in turn could impact the provision of health services and affect the decision making process of the provider in terms of quantity (overuse or withhold) and quality of services. It has to be noted, however, that, governments can allocate a greater share of public revenues to health and health providers to increase the size of the health system operations, thereby enabling greater attainment of financial protection and utilization goals. In addition, progress towards UHC can be promoted through actions to improve efficiency, equity in the distribution of resources, transparency and accountability. These intermediate objectives for UHC favor the cost structure and its use in greater detail, and hence, potentially limit access to care which is well documented in the cost coverage axis.

This paper unpacks the definition of costing as used to depict universal health coverage in the World Health Organization's World Health Report 2010. The paper shows how the proposed costing in five provinces of Vietnam can provide better funds for primary care, embody specific health system goals and objectives, and provide better services and improved population health. The costing studies in Vietnam are conducted at several public health facilities with sizeable budget percentages and introduce a system which can be replicated and implemented at the national level. Thus, this system provides an experimental field to examine the providers' behavior under a variety of costing scenarios and structures. The purpose of the paper was to assess the association between costing, providers and the population in order to reach better future financing models and thus "more health for money".

Materials and Methods

This cross-sectional study was conducted on a representative sample of health care providers in Vietnam, a predefined selected sample of 92 facilities in five provinces in Vietnam (n=92). P was designated for the population served by the piloted facilities. The sample was representative with respect to the distribution in ownership of the public primary healthcare providers in Vietnam. The sample represented the two clusters of providers, namely the Ministry of Health (MoH) and Vietnam Social Security (VSS). A list of all working facilities were obtained from the MoH and from each of the five selected Provincial Departments of Health. The data collection spanned over one full year (2013) and adopted a "take-all" strategy in selecting cost items for this study. It included on one hand all cost items at a facility type and on the other hand the population living in the provinces and all patients visiting the health facilities for primary health care treatment, including those who came for revisit and or renewal of medication prescription.

Five provinces have been targeted, reviewed and sent to the MoH Department of Planning and Finance and endorsed by the National Technical Group including Ha Noi, Ha Nam, Nghe An, Khanh Hoa and Gia Lai provinces. The targeted providers included 26 provincial health centers from the targeted provinces. It included 6 from Ha Noi, 3 from Ha Nam, 6 from Nghe An, 3 from Khanh Hoa and 6 from Gia Lai. For District Level, it consisted of 3 District Hospitals and 3 District Health Centers and 9 CHCs for each province. (Appendix B)

The primary source of data was an observation sheet on the process, number of contacts and budget line items for every selected provider. The observation sheet had two different sections. One section included provider's characteristics, grouping direct / indirect cost based on the government budget line items and patient groups and ages. The second section focused on population sizes and uses of medical services (P). For this study, cost centers were measured and earmarked by direct and indirect absorbing and support cost centers.

Categorical variables, such as expenditures by line items, patients' needs and services provided, were analyzed using build-in comprehensive matrices. Continuous variables, such as the providers' type, its budget and level of care, were analyzed using tests of means, t-test for dichotomous variables and ANOVA (with and without covariance) for variables with more than two categories. The unit of analysis was the cost items and its relative weight based on facility type. Excel 2013 and SPSS were used for analysis.

Questionnaire design

The questionnaire was divided into two sections. In Section 1, study objectives and political implications were presented, alongside some introductory information about costing, facility characteristics and population covered per population size. In order to justify the use of data and its valuation, example forms from previous preliminary costing studies were cited and the expected data needed was emphasized. Available sources of data⁷ were mentioned, and respondents were reminded of using their own data set as it is for more updated and recent data. (See Appendix A)

In Section 2, respondents characterized the status quo of their budget, revenue generated and expenditures per cost items based on their official statutory accounts for the years 2013 (see Appendix A). Current local monetary value of the Vietnam Dong was used. Given that the data quality level varied across respondents, and that some respondents had a problem collecting updated data especially from CHC where data is unavailable, variable degrees of quality improvements – validated with District and provincial authorities – were assessed by the different respondents.

⁷ General Statistic Office, The 2009 Vietnam Population and housing census, published June 2010

Data sources, analysis and assumptions

The level of available secondary data was limited. As a result, it was necessary to rely on surveys at the five piloted provinces, local provincial Departments of Health, experts' opinion and cross-referencing. Cross-referencing sources also complicates data collection due to conflicting results. Data included in this report must therefore be considered with a degree of caution. Final results were also checked for plausibility with other province-wide studies (2013 costing studies at Bac Kan and Cao Bang⁸). Again time limits obliged a pragmatic approach. International data sources (costing in Darfur Sudan⁹ and Yemen¹⁰) were used to validate the results with regards to percentages of line items.

A more thorough analysis may take as much as six months to collect and complete data. However, even this length of time would not resolve the fundamental problems of the absence of comprehensive epidemiological data and unpublished accounts. The potential numbers of contacts and patients from the recent Total Curative and Preventive Health Services collected during December 2014-February 2015 were used.

To estimate drug and laboratory interventions, we used data provided by VSS to providers, specifically funds transferred to District Health Centers and Hospitals.

User-charges and cost sharing were derived from the providers in estimating internal revenues.

Medical and non-medical supplies were collected from the providers' accounts and the finance department. Direct overhead and other facility level running costs were estimated similarly.

Indirect overheads like managing facility at one level by a higher level authority were assumed for a 5% of Total expenditures (i.e. cost not associated with the direct production of services).

Data were collected for the year 2013 and results were calculated based on that year, without taking into account the inflation rate after year 2013. It might be necessary to perform yearly updates and consequently future calculations as deemed necessary.

Finally, a major consideration in any costing exercise is the allocation of overhead and indirect costs to productive activity. Again simple rules were applied in this illustrative exercise. At the facility level, total costs to the GOV were those considered and simply divided by the projected activity level. In a full costing exercise, particularly for district hospitals, this simple rule is likely to be too crude to reflect the difference between departments. Indirect overheads were allocated in proportion to employed persons per facility. Clearly the fewer the facilities under public management the higher the cost per facility.

⁸ AzzamO, Lux Development July 2013, BHSP costing study of Bac Kan and Cao Bang, (technical report-unpublished document).

⁹ AzzamO, The World Health Organization WHO March 2013, Cost of Running Basic Health Services in Darfur Sudan, unpublished document

¹⁰ Grant Rhode, EU Costing and Finance issues with respect ESP,2004 (technical report)

Limitations and description of variables

The assumptions in the model are numerous. These are detailed, where necessary and possible, in the spreadsheet model which accompanies this report. The key assumptions of the model are:

- Commune Health Centers are considered as the first level of primary health care facilities. In addition, the basic scenario assumes that there is no duplication in coverage between Commune Health Centers and District Hospitals.
- A number of observations pertaining to the expected items available in one province don't show in another. Where this is the case, an estimation of best guesses and adjustment of some indicators were considered in the spreadsheet model of each provider's type.
- An attempt was made to specify the drugs and consumables used at each level of facilities, however providers were unable to provide such data. This led to crude estimations. Accordingly, an average of Drug expenditures per facility type was used and a future detailed study for only drugs and consumables needs to be developed in a more specific and detailed study.
- The nature of the costing work necessitates a reform process in terms of data analysis and reporting, meaning that simple standard costing models need to be initiated using the attached instrument to collect data prospectively.
- Capital costs and asset values are those reported lately by international donors, namely Lux Development, supported a few provinces in the building of facilities from 2011-2015.
- Indirect costs (i.e. costs not directly related to production) were considered as 5% of total expenditures to cover the management and supervision of District, Provincial and Central authorities.
- Out-of-pocket payments were provided by the facilities and where no data was available we used an average of the collected data.
- Costs considered are those of the GOV and financing agents in the health sector. Costs refer to the presumed costs of annual operation. The investment costs or restructuring costs in terms of achieving the scenarios are not considered. Moving towards investment feasibility studies, real-time and implementable plans will be important.

The Vietnam results below must therefore be considered as illustrative of a broad direction rather than precise point estimates. The Results from Vietnam were compared to Darfur Costing Results and analyzed to propose a viable alternative to international costing current practices.

Results

Econometric/statistical tools and testing

The consistency of the quantitative and qualitative measurement scales, used to characterize quality levels for the “Geographical Proximity” and the “validity” attributes, was assessed using an analysis of variance (ANOVA), based on respondents’ declared data.

Table 1

Sample characteristics

Variable	N (%) or mean
Sample size (response rate)	102 (90.1%)
Sample size (net)	92
Providers Type	
Provincial Hospitals (PH)	6 (5.9%)
Provincial Health Centers (PHC)	26 (25.5%)
District Hospital (DH)	10 (9.8%)
District Health Centers (DHC)	15 (14.7%)
Commune Health Centers (CHC)	45 (44.1%)
Geographic zoning distribution of providers	
Cities & Capital of the Province	6 (7.7%)
Districts	18 (23.1%)
Villages	54 (69.2%)
Population served by public providers	P (%) or mean
Cities & Capital of the Province	17.4%
Districts	21.1%
Villages & Communes	61.5%

This study observed that 7.7% of the public facilities are providing services to 17.4% of the population at the capital city of each of the piloted provinces, where more than 82% of the population are covered by 92% of the providers (Table 1). Of all observed results, close to 21% of the population were treated at the District level and more than 61% at commune and villages level. The majority of Communes and Districts’ Hospital Managers (90%) reported that funds provided to CHCs are minimal if you compare the population size served by those facilities (Table 2).

Table 2

Population distribution by urban/rural, and region and provinces/cities

Variable	Total P*	P1 Urban	P2 Rural	P3 City	P4 Districts	P5 Villages
Total Population (country)	85,846,997	25,436,896 29.6%	60,410,101 70.4%			
Hanoi	6,451,909	2,644,536	3,807,373		2,422,100	4,029,809
Ha Nam	784,045	74,670	709,375	139,814	165,433	478,798
Nghe An	2,794,773	374,797	2,537,244	303,714	589,697	1,901,362
Khan Hoa	1,157,604	461,516	696,088	392,279	244,254	521,071
Gia Lai	1,274,412	364,064	910,348	208,634	268,901	796,877
P (population) % (mean)	12,462,743	3,919,583 31.2%	8,660,428 68.8%	3,466,541	5,298,095	3,698,107
Mean (Not included Hanoi)				17.4%	21.1%	61.5%

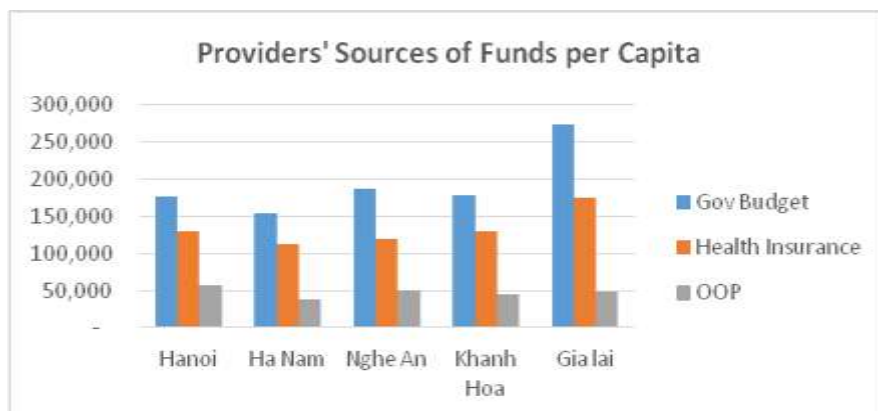
*P designated for population size

Ref: Data collected from the last Vietnam official Census "2009 Vietnam Population and housing census", General Statistics Office, Ministry of Planning and Investment

As per the Budget and Revenue generated, results show that over 50% of the CHCs and District Hospitals' funds are financed by the Government budget on a yearly basis, 34% from Health Insurance and less than 15% from a fee-for-service mechanism (Figure 1). This provides evidence that almost 85% of the funds are financed from the GOV and Health Insurance, which means that obtaining additional public "Money for Health" is highly difficult. Thus it is important to analyze the cost items and expenditures in order to make better use of available resources and "get more" use of money in terms of providing needed services to the population; in short, to improve the effectiveness of the funds and the way they are managed and used. Hence, finding ways to better the use of the existing funds is more relevant than finding more money for health.

Figure 1

Available Budgets' Funds & Sources of Providers' Income



Addressing cost effectiveness and its policy is an integral part of efforts to move towards “better Health for Money”. It is an essential component for the achievement of Universal Health Coverage (UHC), or any other means of coverage for the whole Vietnamese population. For that, proposing better costing procedures aimed explicitly at improving the way a facility is managed, namely, efficiency in using the providers’ funds and resources can enable greater attainment of UHC objectives. Presumably, the “savings” from efficiency gains are retained and reallocated within the provision of services, for actions that stimulate efficiency have the same potential effects as an increase in the level of health spending. , Efficiency should not be equated simply with “cost containment” or as an excuse to reduce public spending on health. Certainly from a health policy perspective, the aim is to increase attainment from a given level of funding rather than to reduce funding to achieve the same level of attainment. More broadly, however, evidence suggests that when the efficiency gains are treated as “savings” by a country’s finance authorities, the incentives for further efficiency gains are diminished.¹¹ This suggests that extracting efficiencies from the providers in the name of budgetary savings is self-defeating. There is always a difference between new funds for health for the purpose of making patients better off, and managing with existing money for better health services. Three main operational issues resulted from our study: (i) The funds available are enough to run most needed services, (ii) the funds are not used efficiently, that is allocated to the right cost items and (iii) the funds are not linked to the populations served at the three levels of providers of the provinces.

When the facilities of the five provinces were queried about the population/providers’ distribution patterns, results showed that no standard accreditation system was used in addition to significant differences and gaps in relation to equity in distributing facilities (Table 3, Figure 2).

¹¹ Chakraborty S, O’Dougherty S, Panopoulou P, Cvikl MM, Cashin C. Aligning public expenditure and financial management with health financing reforms. In: Kutzin J, Cashin C, Jakab M, editors. Implementing health financing reform: lessons from countries in transition. Copenhagen: World Health Organization; 2010. pp. 269–98.

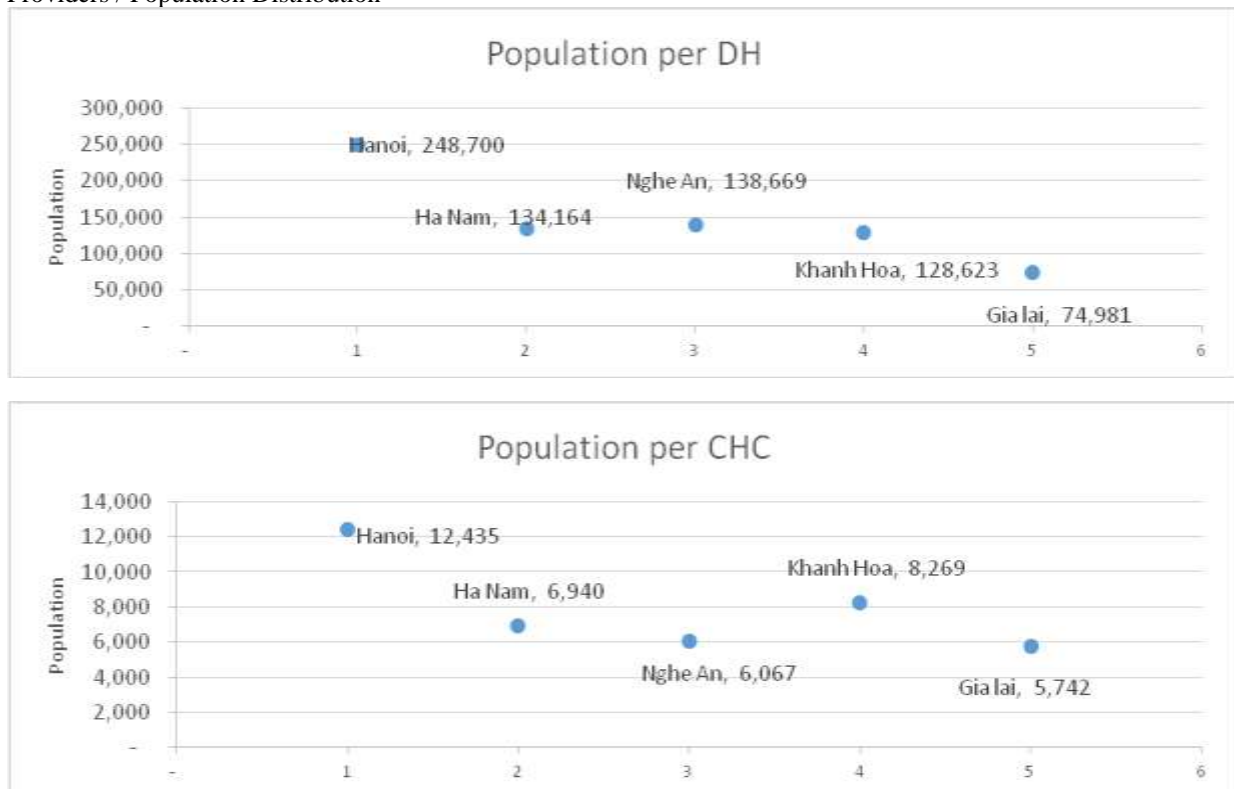
Table 3

Facilities to population distribution

Variable	n	n1	Gap (%) or mean
Providers Type			
Hanoi			
Provincial Hospitals (PH)	6	14	8
District Hospital (DH)	19	144	221
Commune Health Centers (CHC)	580	1202	622
Ha Nam			
Provincial Hospitals (PH)	1	1	-
District Hospital (DH)	5	16	11
Commune Health Centers (CHC)	116	134	18
Nghe An			
Provincial Hospitals (PH)	1	1	-
District Hospital (DH)	21	58	37
Commune Health Centers (CHC)	480	485	5
Khanh Hoa			
Provincial Hospitals (PH)	1	1	-
District Hospital (DH)	9	23	14
Commune Health Centers (CHC)	140	193	53
Gia Lai			
Provincial Hospitals (PH)	1	1	-
District Hospital (DH)	17	25	8
Commune Health Centers (CHC)	222	223	1

Figure 2

Providers / Population Distribution



Based on the criteria for grading of Health facilities applied in Vietnam and in order to estimate the number of needed health facilities (n), we used the following benchmark for distributing health facilities per number of population: (1) One Commune Health Center to cover at least 6,000 population, (2) One District Hospital to cover 100,000 population and (3) One provincial Hospital to cover over 200,000 population. Assuming the above distribution of the needed health facilities per population size, Table 3 defines the gap in distributing needed facilities to population size of the piloted provinces.

Results of the cost items distribution of the five provinces showed that on average 70% of the providers' budget is used for human resources for health, 17% for drugs and supplies, and 9% for operating cost (Table 4). Capital was considered under the development investment budget and was financed separately under domestic and foreign sources.

Table 4

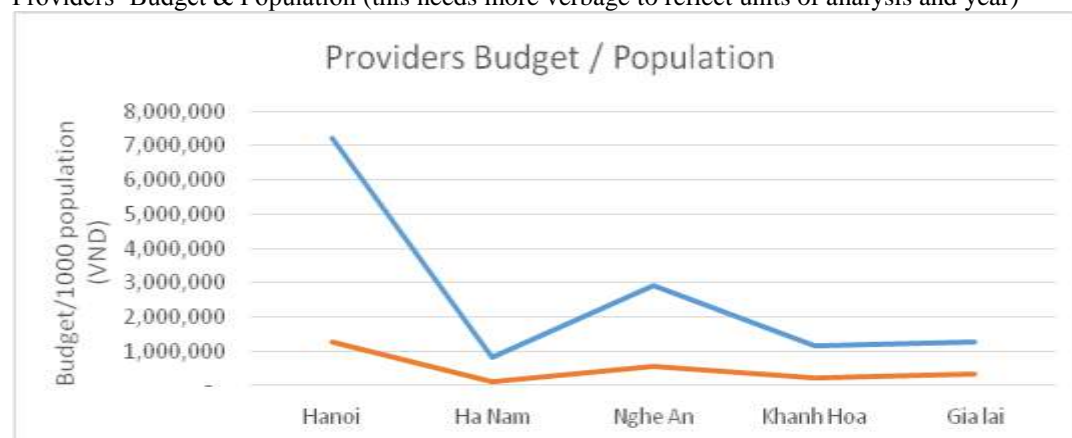
Cost Items Distribution Result

Variable (N in Million VND) (%) or mean	CHCs	DHs	PH	Mean
Population	6,000	100,000	200,000+	
Human Resource for Health (Personnel)	1,295 (84%)	10,280 (79%)	67,866 (85%)	0.82
Drugs	149 (10%)	1,660 (13%)	1,180 (1%)	0.05
Consumables & Supplies	26 (2%)	125 (1%)	260 (1%)	0.01
Production overhead	49 (3%)	655 (5%)	9,644 (12%)	0.11
Capital depreciation	17 (1%)	75 (1%)	596 (1%)	0.01

In general there was no significant association between facilities budget and population. However, differences were observed between Hanoi and other provinces (Figure 3).

Figure 3

Providers' Budget & Population (this needs more verbage to reflect units of analysis and year)



Discussion

In the view of the survey and analysis, the results indicate that a universal application of the cost of running a facility is achievable. However, the results cannot answer the question whether the GOV is willing to pay the total price in terms of “financing all facilities to cover the whole population of over 85 million”. What is clear, however, is that out-of-pocket payments still need to be made and that the greater the provision of essential health services, the less such sacrifices might have to be made; . As evident in the data, financial gaps between revenues and expenditures exist in the five piloted provinces. To address the “financing gap” there are essentially two options to consider:

- Change the balance between revenues and expenditures (increase revenue / decrease expenditures)
- Change the system of financing health care providers (maybe allocating more funds to essential cost items or looking at alternative payment mechanisms)

In this paper, we addressed the question of the impact of an adverse variation in paying providers based on the most frequent and priority services vis-a-vis improving the quality of delivered care. The increase in number of health facilities built by donors and the operating cost of such facilities may need further funds. Out of pocket couldn't be a good option as it cause a severe impoverishment in the Vietnamese context. A strong relationship and a gap was demonstrated between population needs and cost of delivering services. The results suggest that the value of filling the gap in providers distribution to cover the whole population, (e.g. geographical/population proximity) as well as the funds required to run needed facilities, cannot, at present, be fully funded by the government. On the other hand, funding health care services by patients (paying out of pocket) might affect negatively the utilization rate. However, one alternative solution could be the funding of unnecessary services, which can be viewed as luxury goods, by patients.

An interpretation of our results would state that the cost of running providers of health services is economically high for Vietnam. A negative effect remained significant after calculating the cost. Therefore allocating more funds for health by the government and adjusting the budget to public providers appears to be difficult at present. Given the same budget, an alternative cost containment strategy might be required. This clearly suggests that we must consider a “more health for money” approach, rather than a “more money for health” approach. The latter is not achievable and may have a multi-dimensional effect on government budget, utilization, impoverishment and health of the population. We first discuss this multi-dimensional impact and its association with government budget and population coverage. Following, we attempt to develop the discussion further and provide arguments about how the costing results should be interpreted in light of our study. We conclude by discussing the implications of our results on public policy decisions with regard to financing health care services in developing countries, in general, and in the context of Vietnam subject in particular. Russell¹² has argued that, being willing, and able, to pay for a commodity does not automatically imply being able to afford the latter, mainly because the social opportunity cost of payment may be too high to be

¹² Russell S. Ability to pay for health care: concepts and evidence. *Health Policy and Planning* 1996;11(3):219–37

socially acceptable. In a similar vein, our study may complement Russell's argument using Sen's theory about the inability of certain groups of individuals to manage to desire adequately¹³. The main message of our study can be formulated as follows: (1) providing services to the population based on needs assessment and supported by appropriate funding for sustainability (2) more services will lead to more needed funds, (3) Not being willing to pay for a commodity does not automatically imply the absence of preferences for the latter. This is because, under certain conditions, population experience a change in their perceptions of what is achievable and what is not, and adapt their expectations to the realities and constraints of their lives. As a result, they may no longer be able to express all their preferences in an adequate manner, given particular life conditions. These considerations have, for a long time, distinguished economists' from psychologists' in their approaches and methods of reasoning about the elicitation of people's preferences¹⁴. Although the more conventional interpretation of our results in terms of demand shift cannot be totally excluded, in our analysis we bring some additional indication that earmarking a benchmark of costing health providers may provide better economic view and expectation of the government of Vietnam. Therefore, thinking about building new facilities and/or accepting a Donors' loan to build new ones, may be better viewed as expressions of attitudes rather than economic evaluation.

In addition, our results suggest that the consequences of applying additional out of pocket payment mechanisms in densely populated provinces, like Khanh Hoa and Nghe An, have negatively affected the population and might be the cause of impoverishment. Realistically, it is important to note that in Vietnam, the absence of universal coverage safely translates into most needed funds for most needed services which support the statement of "More Health for Money" rather than universally - coverage for everything. Another interpretation when looking at the cost of health services and availability of funds in a populated area is that a de facto arrangement has been the best solution where people by necessity must rely on family financial resources in addition to government support. In this particular instance, it seems that in such populated provinces, people need to prioritize access to care than getting all services done.

Cost of facilities and economic evaluation study of the providers of the five provinces in Vietnam have been mainly developed and applied in the context of publicly financed health care systems, and with the purpose of contributing to the monetary valuation of health gains for cost-benefit analysis (CBA) of alternative programs. It is of utmost importance to interpret the costing results with caution¹⁵, mainly when applications are to be extended from economic calculus (a normative perspective), to attain positive economic objectives. Even in the normative context of CBA, it has been argued that out of pocket payment or even willingness to pay should be weighted if patients' preferences are proven to be not equivalently distributed amongst the poor and the rich¹⁶. In the context of demand assessment for pricing purposes, it has been also argued that a proper integration of the issues of payments' affordability must be taken into account. Our study strongly suggests that in addition to affordability, individuals' capabilities to desire adequately and express preferences should also be taken into account

¹³ Sen A. Inequality re-examined. Oxford: Clarendon Press; 1992

¹⁴ Fischhoff B, Manski CE, Elicitation of preferences. Reprinted from Journal of Risk and Uncertainty 2000;19(1-3):284

¹⁵ Johannesson M. The contingent valuation method—appraising the appraisers. Health Economics 1993;2(4):357-9

¹⁶ Donaldson C. Valuing the benefits of publicly provided health care: does 'ability to pay' preclude the use of 'willingness to pay'? Social Science and Medicine 1999;49(4):551-63

– when interpreting providers’ costing data and needed funds to run health facilities. In particular, the process of impoverishment may affect such capabilities in certain vulnerable groups a lot more significantly than in the rest of the population.

Our study shows that under severe impoverishment conditions, patients’ willingness to pay for improving the quality of delivered care diminish steeply with poverty levels. Given that quality improvement is known to be an unavoidable dimension in determining patients’ reaction to price variation¹⁷, using complementary financing mechanisms based on mobilizing private resources (e.g., cost recovery policies) under exacerbated poverty conditions, will critically penalize health care users, and mainly the most vulnerable amongst them. Other financing mechanisms based on more efficient allocation of public resources amongst the different public sectors should be promoted as an alternative to assure equitable health care utilization. The technique of re distributing funds based on the proposed line items benchmark of cost of running health facilities may help bringing greater clarification that more “health for Money” is better than more money for health in a socio economic situation of a low income country like Vietnam.

Conclusion

The results of this study support the notion that costing studies can only serve as a start in the consideration of wider policy issues of financing and managing health care services. Health services are always linked to provision, payment mechanism and affordability. Our study suggests that cost of providers to run essential services can lead to better health outcome, contain unnecessary cost items, minimize the funds which are covered by the patient and thus decrease the risk of impoverishment. It suggests that under severe impoverishment, the use of direct cost recovery mechanisms, and the introduction of user fees, as complementary means of financing health care, may have many unintended negative consequences for social welfare. We conclude that contrary to some a priori beliefs that they are exclusively an ad hoc tool to minimize health facilities’ budgets, legitimize cost recovery policies and reduce public delivery of health care, costing studies may indeed be carried out in a more “value-neutral” approach. Such approach implies a clear awareness that costing provides policymakers with valuable information about services delivery values from the providers’ perspective, which are the main producers of health services and sensitive to the economic and social environment. This costing study and its methodology should assist in activating rigorous, and continuous planning of health care financing in Vietnam which explicitly takes into consideration the tools and instruments used in the five piloted provinces, collecting prospective data for all other provinces and replicating the system at national level.

The result of this costing study showed the association between cost of running a standard provider type and payment mechanisms on one hand and expenditures/cost budget items and population size on the other hand. The results supported the well-established notion that costing mechanisms are associated with providers size / population’ behavior, and presented a

¹⁷ Mariko M. Quality of care and the demand for health services in Bamako, Mali: the specific roles of structural, process, and outcome components. *Social Science and Medicine* 2003;56(6):1183–96

benchmark to fund such provider as a significant correlate of provider's practice in provincial level of care settings in Vietnam. Another result is that Human Resource for Health (HRH) was slightly more funded among District Hospitals (DH) than under Provincial Hospitals (PH) and Commune Health Centers (CHC). This was more observed with differing levels of care. Nurses had higher income rates than the physicians at most CHCs. This could be due to the limited number of physicians at lower levels which were mainly managed by nurses and medical assistants. In the lower levels, government try to limit employing physicians by employing a greater number of nurses who refer more complex cases to physicians in higher levels. Further research is needed to validate this observation and its possible covariates.

Similarly, physicians in District Hospitals received greater remunerated than those in Provincial hospitals. This could indicate a tendency among District hospitals to request more funds in an attempt to increase income. This comes in accordance with other findings which have also reported that income is greater in Provincial Hospitals than District Hospitals compared to population size.

On the production of health services front, utilization of services were observed more among District Hospitals than Centers. District Hospitals have more flexibility than CHCs in terms of allocating budgets, so there was a tendency among some DHs to allocate more funds to their activities at the expense of CHCs.

In another set of findings also related to cost items, the cost items distribution did not correlate with the needed services and activities within the providers or when comparing with the providers' size. In general and under the government decentralization, District Authorities in Vietnam request the needed budget from the provincial authorities and been given the power to distribute budget funds to lower level (CHCs) based on the need. However CHCs are always at a disadvantage when it comes to receiving the funds needed. This is due to a lack of supervision and accountability of provincial authorities to District Hospitals. Accordingly, incentive mechanism need to be deployed to encourage and monitor DHs and CHCs practice pattern along with appropriate management structure and supervision which would help enforce the regulations, as well as the practice and providers funds distribution. Furthermore, the effect on the provider behavior was further accentuated when the two independent variables, budget and population, were considered together. The proportion of the budget was higher among DHs than CHCs, whereas the reverse was observed when compare Provincial Hospitals (higher level) with District Hospitals (lower level)

The effect of defining these costing results on population needs and practice patterns was vital especially when comparing population served with providers' budget and needed resources. The differences in funds allocation between the three levels of providers tend to minimize services provided to population at lower levels by spending more at higher levels. The result showed that the Government of Vietnam, with no reason, tended to spend less at CHCs and PHs and encourage people to use more DHs. Under such circumstances, CHCs and PHs tend to see less population in order to minimize their losses in terms of effort and physical resources.

This was more observed in this study when the cost per 1000 population at CHCs and PHs was 268 Million VND (USD 12,806) and 411 Million (USD 19,570) respectively and 135 Million (USD 6,447) at DH. Another observation is that CHCs had more incentives not to treat patients or refer them to higher level and thus the cost of health care could escalate. The latter is due to delay in treating patients when needed or to being treated at higher levels. A suggestion based on the findings relates to the need to re-evaluate the whole budget mechanism. Any alternative payment structure by providers has to take into consideration the cost items and resources used in the delivery of health services.

Funding providers is supposed to be based on an agreement between the government and the public providers, which could be a contract. Appropriate incentives could be built into health providers' contracts to enhance equity in providing services to the provincial population of Vietnam. Then, reward or penalties could be made based on the provider meeting certain performance levels or standards. However, the caveat in this is that contracts do not incorporate all the transactions in the provision of services. For that, providers might "game" the performance measures by being selective in their performance emphasizing behaviors or tasks that would increase their payouts¹⁸. Alternatively, provincial authorities may rely on a system where the information asymmetry is in the benefit of the population and not the providers which would then force the providers to use available information productively and to avoid engaging in dysfunctional behaviors. In other words, performance evaluation could be the solution and could be based on a combination of subjective and objective measures contingent on compliance with standards and protocols appropriated with some incentives. Future research will then have to test the consistency of such a measure in remunerating providers in provincial health care settings of Vietnam.

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¹⁸ Baker, G. P. (2005). Incentive Contracts and Performance Measurement. *Journal of Political Economy*, 100(3), 598-614.

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Appendix A

Instrument & Methodology used for cost of running facilities at 3 level of care

Section 1. Guideline and Protocol for the data collection

Objectives of the survey

1. To provide cost of running the providers in the 5 piloted provinces in Vietnam.
2. To standardized cost items
3. To link population distribution with providers distribution and present the gap between the needed and the existed providers.

Expected outputs from the survey

- 1- Compilation of data sources and presentation of total cost per line items within each provider's type.
- 2- Cost of providers estimates through an instrument and "information matrix".
- 3- Extensive disaggregation of the cost items (cost centers) beyond the general categories of providers' line items expenditures.

Design of the survey

- 1- Elements of the survey included:
 - a. Cost items by provider type
 - b. Covers the 3 facility' levels of care
 - c. Data and information will be collected for a full year of 2013 where data are audited and which is easy to access.
- 2- The expected timeline of the survey was December 2014- March 2015
- 3- Surveys collected at CHCs, District Hospitals, and Provincial Hospitals. List of health care providers involved in this survey are provided in Appendix B

Selection of providers

Survey data are an important source of information on actors with an important role in costing providers, and must be used very carefully. The validity of data rests on the way in which the data are generated. There is a clear trade-off involved in data collection in any information system, including health facilities line items and utilization rate. Our aim is to strike a balance between cost, utilization, and population.

Targeted providers are:

- 1- At provincial level: 1 Provincial Hospital in each of the 5 provinces

- 2- At District Level: 3 District Hospitals and 9 CHCs in each of the 5 provinces

Steps to follow

- 1- The data to be collected from the three levels of providers' care in each province for the year 2013.
- 2- The below template of cost items per facility to be used.
- 3- The template for cost of facilities based on the training sessions provided in December.
- 4- Each province to provide full data on one provincial health facility, three district health centers and 9 CHCs.
- 5- Data to be monitored and cleaned before submission.
- 6- Submission date 31st of March 2015.

Section 2. Instrument/Forms and Indicators requested

FORM 1. Facility Line items (2013 end of year statutory accounts)		Year 2013	Needed Fund Proposed
1. REVENUES			
1.1. GOV Budget			
1.2. Revenue from VSS			
1.3. Internal Revenue			
1.3.1. Consultation Fees			
1.3.2. Drugs Fees			
1.3.3. Other Fees collected			
TOTAL REVENUES			
2. DIRECT EXPENSES			
2.1. Personnel			
2.1.1. Base Salary(ies)			
2.1.2. Incentives & Allowances			
2.1.3. Training Cost			
2.2. Drugs			
2.3. Consumables & Supplies			
2.3.1. Medical			
2.3.2. Non-Medical			
2.3.3. Others			
2.4. Production Overhead			
2.4.1. Utilities			
2.4.2. Transportation			
2.4.3. Maintenance of Equipments (e.g. computers)			
2.4.4. Others			
2.5. Capital Cost			
2.5.1. Building Depreciation			
2.5.2. Equipments Depreciation			
TOTAL DIRECT EXPENSES			
3. INDIRECT EXPENSES			
3.1. Locality / District Management			
3.2. Provincial Management			
3.3. Central Management			
TOTAL INDIRECT EXPENSES (Assumed 5%)			
TOTAL DIRECT & INDIRECT EXPENSES			

FORM 2: Tính Chi phí - 2013/2014 / Costing - 2013/2014

Nhân lực y tế/ Summary HRH

Sở Y tế/ DOH:

Year 2013	Needed Funds
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Name of the health facility	Tên cơ sở y tế:		
Facility Type	Loại CSYT:		
Province	Tỉnh:		
District	Huyện:		
Covered population	Dân số:		
Number of beds	Số giường bệnh:		

I. DETAILED DATA/SỐ LIỆU CHI TIẾT

Skill Mix/ Tên nhóm nhân sự			Ave No. of staff per Facility	Needed staff per Facility
<i>Medical Staff/</i>	Specialist	BS chuyên khoa		
	Doctor	Bác sĩ đa khoa		
	Anesthetic Technician	KTV Gây mê		
	Dentist	Nha sĩ		
	Ophthalmologist	Bác sĩ nhãn khoa		
<i>Diagnostic</i>	Pharmacist	Dược sĩ		
	Medical Assistant	Y sĩ		
	Laboratory Technician	Kỹ thuật viên phòng xét nghiệm		
	X-ray Technician	Kỹ thuật viên X quang		
	Dental Technician	Kỹ thuật viên nha		
	Pharmacy Technician	Kỹ thuật viên dược		
	Ophthalmology Technician	Kỹ thuật viên nhãn khoa		
	Staff Nurse	Y tá trưởng		
	Nurse (4 years Training +)	Y tá (đào tạo 4 năm hoặc hơn)		
	Nurse (2-3 years Training)	Y tá (đào tạo 2-3 năm)		
	Nurse (1.5-2 years Training)	Y tá (đào tạo 1.5 - 2 năm)		
	Nurse (3 months training)	Y tá (đào tạo 3 tháng)		
	Midwife	Nữ hộ sinh		
	Traditional Medicine	Y học cổ truyền		
	Village Health Worker	Cán bộ y tế công cộng		
	Nutrition officer	Cán bộ về dinh dưỡng		
	Nutrition guide	Cán bộ tư vấn dinh dưỡng		
	EPI Officer	Cán bộ TCMR		
Statistician	Cán bộ thống kê			
Health Promotor	Cán bộ truyền thông			
<i>Admin Staff/ Hành chính</i>	Hospital Ord	Cán bộ hỗ trợ		
	Hospital Director	GD Bệnh viện		
	Hospital administrator	Cán bộ quản lý hành chính		
	Accountant	Kế toán		
	Cashier	Thủ quỹ		
	Admin staff	Cán bộ hành chính		
	Technician (2-3 years training)	Kỹ thuật viên (đào tạo 2 - 3 năm)		
Technician (middle degree)	Kỹ thuật viên trung cấp			
Other	Khác			
Worker / Guard	Công nhân / bảo vệ			
Driver	Lái xe			
Total Staff			19	19

Average Salary of Skill Mix/ Lương TB Tên nhóm nhân sự (VND)			Ave Monthly Salary (VND)	Proposed Salary (VND)
Medical Staff/	Specialist	BS chuyên khoa		
	Doctor	Bác sĩ đa khoa		
	Anesthetic Technician	KTV Gây mê		
	Dentist	Nha sĩ		
	Ophtalmologist	Bác sĩ nhãn khoa		
Diagnostic	Pharmacist	Dược sĩ		
	Medical Assistant	Y sĩ		
	Laboratory Technician	Kĩ thuật viên phòng xét nghiệm		
	X-ray Technician	Kĩ thuật viên X quang		
	Dental Technician	Kĩ thuật viên nha		
	Pharmacy Technician	Kĩ thuật viên dược		
	Ophtalmology Technician	Kĩ thuật viên nhãn khoa		
	Staff Nurse	Y tá trưởng		
	Nurse (4 years Training +)	Y tá (đào tạo 4 năm hoặc hơn)		
	Nurse (2-3 years Training)	Y tá (đào tạo 2-3 năm)		
	Nurse (1.5-2 years Training)	Y tá (đào tạo 1.5 - 2 năm)		
	Nurse (3 months training)	Y tá (đào tạo 3 tháng)		
	Midwife	Nữ hộ sinh		
	Traditional Medecine	Y học cổ truyền		
	Village Health Worker	Cán bộ y tế công cộng		
	Nutrition officer	Cán bộ về dinh dưỡng		
	Nutrition guide	Cán bộ tư vấn dinh dưỡng		
	EPI Officer	Cán bộ TCMR		
	Statistician	Cán bộ thống kê		
	Health Promotor	Cán bộ truyền thông		
Admin Staff/ Hành chính	Attendant	Hộ lý		
	Hospital Director	GD Bệnh viện		
	Hospital administrator	Cán bộ quản lý hành chính		
	Accountant	Kế toán		
	Cashier	Thủ quỹ		
	Admin staff	Cán bộ hành chính		
	Technician (2-3 years training)	kỹ thuật viên (đào tạo 2 - 3 năm)		
	Technician (middle degree)	Kỹ thuật viên trung cấp		
Other	Khác			
Worker / Guard	Công nhân / bảo vệ			
Driver	Lái xe			
Total Staff		Tổng	-	-

Yearly Salary by Major Staff			Ave Yearly Salary per selected staff (VND)	Proposed Yearly Salary per selected staff (VND)
Doctor	Tổng số bác sĩ			
Medical Assistant	Tổng số Y sĩ			
Midwife	Tổng số Nữ hộ sinh			
Nurse	Tổng số Y tá			
VHW	Tổng số NVYTĐ			
Admin Staff				

Target audience/Đối tượng đào tạo		Training Cost Summary /Tổng chi phí đào tạo năm (VND)	Proposed Training Cost (VND)
Training Medical Staff	Đào tạo cán bộ điều trị		
Training Nursing Staff	Đào tạo y tá, điều dưỡng		
Training Admin Staff	Đào tạo cán bộ hành chính		
Overseas Training	Đào tạo tại nước ngoài		
Total Training cost	Tổng chi phí đào tạo	-	-

	Overhead / Operating Cost	Chi phí chung/ chi phí hoạt động	Ave Overhead 2013 (VND)	Proposed Overhead per year (VND)
	Telephone	Điện thoại		
	Electricity	Điện		
	Water	Nước		
	Stationery	Văn phòng phẩm		
	Rent and Rates	Chi phí thuê địa điểm		
	Cleaning (Services & Materials)	Vệ sinh, lau dọn (dịch vụ và vật tư)		
	Freight (consumable freights)	Cước chuyên chở (cước chuyên chở hàng hóa mua)		
	Fuel (Ambulance & Launch)	Xăng dầu (xe cứu thương)		
	Travel Expenses (tickets for Docs & PM Staff)	Chi phí đi lại (vé tàu xe của BS và CBNV)		
	Maintenance (Plant, Equipments, Buildings...)	Duy tu bảo dưỡng (Cây cảnh, thiết bị, cơ sở)		
	Purchase of equipments (e.g. computers)	Mua sắm trang thiết bị (máy tính...)		
	Building	Nhà trạm		
	Others (specify):	Khác (nếu rõ):		
	Total Overhead	Tổng	-	-
	Total Capital Cost	Tổng	-	-
	Tổng chi phí dành cho 1 CSYT mới/ Total Cost of a new facility			Proposed funds
	Construction/ Xây dựng			
	Equipment/ Trang thiết bị			
	Total in VND/ Tổng số (VND)		-	-
	Total in USD/ Tổng số (USD)		-	-
	Khấu hao hàng năm/ Yearly Depreciation		Quy mô lớn/Large Scale	
	Construction/ Xây dựng		-	-
	Equipment/ Trang thiết bị		-	-

Appendix B

Data Collection Sheet- Providers / Provinces

Data Collection Sheet					
	Hanoi	Ha Nam	Nghé An	Khanh Hoa	Gia Lai
Central Level	■ Hue Central Hospital				
Provincial Level	■ Dong Da Gen. Hospital	■ Ha Nam Gen. Hospital	■ Nghe An Gen. Hospital	■ Khanh Hoa Gen. Hospital	■ Gia Lai Gen. Hospital
Specialized Hospitals	■ Cancer Hospital ■ Hospital of Dermatology ■ Eye Hospital ■ Hospital of Kidney Diseases ■ Hospital of Heart Diseases ■ Hospital of Obstetrics and Gynecology ■ Hospital of Lung Diseases ■ Hospital of Mental Health ■ Traditional Medicine Hospital	■ Tuberculosis & Lung Disease Hospital ■ Eye Hospital ■ Leprosy & Dermatology Hospital ■ Mental Health Hospital ■ Traditional Medicine Hospital	■ Obstetrics - Pediatrics Hospital ■ Cancer Hospital ■ Eye Hospital ■ Traditional Medicine Hospital ■ Endocrinology Hospital ■ Tuberculosis & Lung Disease Hospital ■ Mental Health Hospital	■ Tuberculosis Hospital ■ Dermatology Hospital ■ Mental Health Hospital ■ Traditional Medicine Hospital	■ Traditional Medicine - Rehab Hospital ■ Tuberculosis & Lung Disease Hospital
Provincial Health Centers	■ Hanoi's Preventive Health Center ■ Hà Đông's Preventive Center of Tuberculosis & Lung Disease ■ Hà Nội's Center of Reproductive Health ■ HIV/AIDS Preventive and Controlling Center ■ Hà Đông's Center of Reproductive Health ■ Sub-Department of Food Hygiene and Safety	■ Provincial Preventive Health Center ■ Provincial Reproductive Healthcare Center ■ HIV/AIDS Preventive and Controlling Center	■ Provincial Preventive Health Center ■ Provincial Reproductive Healthcare Center ■ Sub-Department of Food Hygiene and Safety ■ Leprosy and Dermatology Preventive & Curative Health Center ■ Malaria Preventive and Curative Health Center ■ Reproductive Healthcare Center	■ Provincial Preventive Health Center ■ Provincial Reproductive Healthcare Center ■ HIV/AIDS Preventive and Controlling Center	■ Provincial Preventive Health Center ■ Preventive Center of Social Diseases ■ Preventive Center of Malaria-Parasite-Insects ■ HIV/AIDS Preventive and Controlling Center ■ Reproductive Healthcare Center ■ Sub-Department of Food Hygiene and Safety
District Level	■ Me Linh District Hospital ■ Tien Phong CHC ■ Quang Minh CHC ■ Chi Dong CHC ■ Thuong Tin District Hospital ■ Thai Hoa CHC ■ Tan Hong CHC ■ Tien Phong CHC ■ Ba Vi District Hospital ■ Quang Dong CHC ■ Van Tao CHC ■ Van Binh CHC ■ Mé Linh District Health Center ■ Ba Vi District Health Center ■ Thuring Tin District Health Center	■ Ly Nhan Health Center ■ Cong Ly CHC ■ Nhan Nghi CHC ■ Nhan Thinh CHC ■ Thanh Liem Health Center ■ Liem Thuan CHC ■ Liem Phong CHC ■ Thanh Nghi CHC ■ Binh Luc Health Center ■ Tieu Dong CHC ■ An My CHC ■ Binh My CHC	■ Vinh City's Hospital ■ Ha Huy Tap CHC ■ Hung Hoa CHC ■ Le Loi CHC ■ Nghi Loc District Hospital ■ Nghi Phuong CHC ■ Nghi Long CHC ■ Nghi Quang CHC ■ Dien Chau District Hospital ■ Dien Doai CHC ■ Dien Hong CHC ■ Dien Phuoc CHC ■ Vinh city Health Center ■ Nghi Loc District Health Center ■ Dien Chau District Health Center	■ Van Ninh District Hospital ■ Van Gia CHC ■ Van Phuoc CHC ■ Van Thanh CHC ■ Dien Khanh District Hospital ■ Dien Lac CHC ■ Dien Xuan CHC ■ Dien Son CHC ■ Khanh Vinh District Hospital ■ Song Cau CHC ■ Khanh Nam CHC ■ Khanh Trung CHC	■ Ayun Pa Town Health Centre ■ Chur Bih CHC ■ Doan Kiet CHC ■ Song Bui CHC ■ Khang District Health Center ■ Tor Tung CHC ■ Kong Long Khong CHC ■ Lo Ku CHC ■ Dak Doa District Health Center ■ Dak Krong CHC ■ Khang CHC ■ Ja Bang CHC ■ Ayun Pa District Hospital
	Mã màu nhập liệu/ Legend for data entry:	■ Done			
		■ Waiting for update/revision by HF			
		■ Not started			
		■ Not received			
	Notes:	All in yellow, gray colors are not following Circular 43 with correct codes			