

# Measuring the Quality of Education and Health Services: the Use of Perception Data from Indonesia

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## Abstract

Satisfaction surveys offer a potentially convenient and cost-effective means for evaluating the impact of decentralization on services. However, concerns regarding subjectivity and selection bias impede greater use of satisfaction data. This paper analyzes satisfaction data about health and educational services from the 2006 GDS-2 survey in Indonesia to assess whether satisfaction data can serve as accurate indicators of quality, despite dubiously high levels of reported satisfaction. We use a modified expectancy disconfirmation model that corrects for selection bias. We find that conditional on the choice of service provider (determined by socioeconomic characteristics and expectations), reported satisfaction varies significantly with actual quality. This two-step selection model offers important, policy-relevant insights into the aspects of service delivery that most affect satisfaction, and highlights differences in priorities across rich and poor districts. Overall, the analysis shows once selection bias and the role of expectations in facility choice have been factored in, the variation in satisfaction level can be highly informative for policymakers and researchers alike.

*Keywords:* Satisfaction Surveys; Perception Measures; Citizen Report Cards; Community Score Cards; Decentralization; Service Delivery; GDS-2; and Governance.

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## I. Introduction

Can satisfaction-related questions be valuable in measuring the quality of public services, specifically in health and education? In examining this question, the paper develops a model for identifying the range of factors that influence satisfaction with services among users and examines how these determinants of satisfaction may vary by the type of service and economic status of regions within a country.<sup>1</sup>

Measuring the quality of public services (or *changes* in their quality over time) has become increasingly important, particularly to monitor or evaluate the impact of fundamental reforms in service delivery, such as decentralization. This has resulted in a range of initiatives attempting to measure “performance” indicators in service delivery. Many of such indicators are conceptually complex and expensive to collect information on. Satisfaction surveys can offer a cheaper and more convenient alternative, but *only* if they can be shown to have information content that is meaningful to measure performance in service delivery.

In recent years, significant progress has been made in the realm of public service delivery measurement (see Amin, Das and Goldstein, 2007 for an overview of these instruments). An increasing number of the tools developed include subjective instruments that gauge citizen perceptions. These encompass citizen report cards, community scorecards, facility exit polls, and citizen satisfaction surveys.

We focus on one type of subjective tool for gauging citizen perceptions, namely citizen satisfaction with services after Indonesia’s “Big Bang” decentralization in 2001, which transformed a highly centralized government to one that gave broad autonomy to the regions in most domains. We use nationally representative data on health and education services gathered in 2006 from the second round of the Governance and Decentralization Survey (GDS-2), which contains detailed questions related to governance and service delivery. The survey collected data on satisfaction from households *and* information on objective quality directly from facilities.

In addition to the methodological question of whether satisfaction surveys yield useful results on facility quality, the findings of this paper also have more direct implications for policymakers in Indonesia. Our analysis of the determinants of satisfaction among service users

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<sup>1</sup> This paper draws significantly from a companion paper by Amin, Dasgupta, and Skoufias (2008) that presents a detailed analysis of satisfaction with health services in Indonesia, using the same dataset. Many of the results from that paper are repeated here, along with new analysis of satisfaction with education services. It is also complementary to the study of Lewis and Pattinasarany (2009) focusing on satisfaction with educational services but abstracting from the issue selection bias.

suggests that users value certain dimensions of “quality” in public services (health and education) more than others, and that these determinants of satisfaction vary between rich and poor districts. This information is likely to be useful to inform policies engaged to improve basic services, well beyond what generic and aggregated measures of satisfaction typically provide.

Section II explains the motivation for this study, examining the limitations of satisfaction surveys and outlining some of the concerns this paper seeks to address. Section III describes the dataset used for our analysis. Section IV discusses the motivation for our model and presents the results from a preliminary analysis of the socio-economic factors that influence satisfaction with health and education services. In Section V, we present a more complex model to correct for selection bias and see how satisfaction varies with objective quality and governance indicators. Section VI discusses the implications of our results for policy and the design of satisfaction surveys.

## ***II. Why do satisfaction surveys merit study?***

Satisfaction surveys merit study for a number of reasons.<sup>2</sup> Even though perceptions of citizens are imperfect indicators of quality of services, satisfaction surveys have considerable appeal as a practical way of measuring the impact of governance reform and decentralization. While other tools have been developed to collect more objective information on service quality (e.g. facility surveys, public expenditure tracking surveys),<sup>3</sup> they are typically more time and labor intensive than satisfaction surveys. Thus the latter can be a quick and easy way for policymakers to measure the impact of governance reforms on government performance, particularly for sectors where measurement of service quality is not easy, *provided* citizen satisfaction is closely correlated with the actual quality of services.

Even as satisfaction surveys are increasingly being used to measure the impact of governance reforms,<sup>4</sup> there is little consensus on whether citizens’ satisfaction reflects the actual quality of services satisfaction surveys. More research is therefore merited on the question of (i)

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<sup>2</sup> See Amin et al (2008) for a more detailed discussion

<sup>3</sup> Facility surveys are used to directly measure the quality of infrastructure and resources. An excellent example is found in Banerjee et al (2004) – their study of 100 villages in the Indian state of Rajasthan combined a household survey and a village census with a detailed facility survey of public and private health providers. Public expenditure tracking surveys (PETS) measure the efficiency of fund flow through different levels of government –see, for example, World Bank (2005) for results from PETS in the primary education sector in Cambodia.

<sup>4</sup> Since the first citizen report card (CRC) initiative was adopted in 1994 in Bangalore, India similar initiatives have been adopted around the world including in Bangladesh, the Philippines, Sri Lanka and Vietnam (Paul, 1999).

*whether* data from perception surveys are useful in measuring quality of services, and (ii) if there is information content, *how* should such data be used and interpreted to measure quality of services.

Moreover, understanding what factors influence citizen satisfaction is crucial in order to evaluate the impact of decentralization. In the typical model linking decentralization to improved outcomes, an important premise is that local governments would improve their performance on account of improved accountability, which in turn hinges on citizens being able to discern between good and bad government and then influence their local authorities.<sup>5</sup> This implies that in order to understand whether decentralization is likely to improve service delivery, it is important to understand what household and community level factors (other than quality of services) determine citizen satisfaction.

The above questions are addressed here by exploring the relationships between satisfaction, household and community characteristics, and the actual quality of service delivery as measured using objective indicators.

### **Concerns with satisfaction surveys and the example of GDS-2**

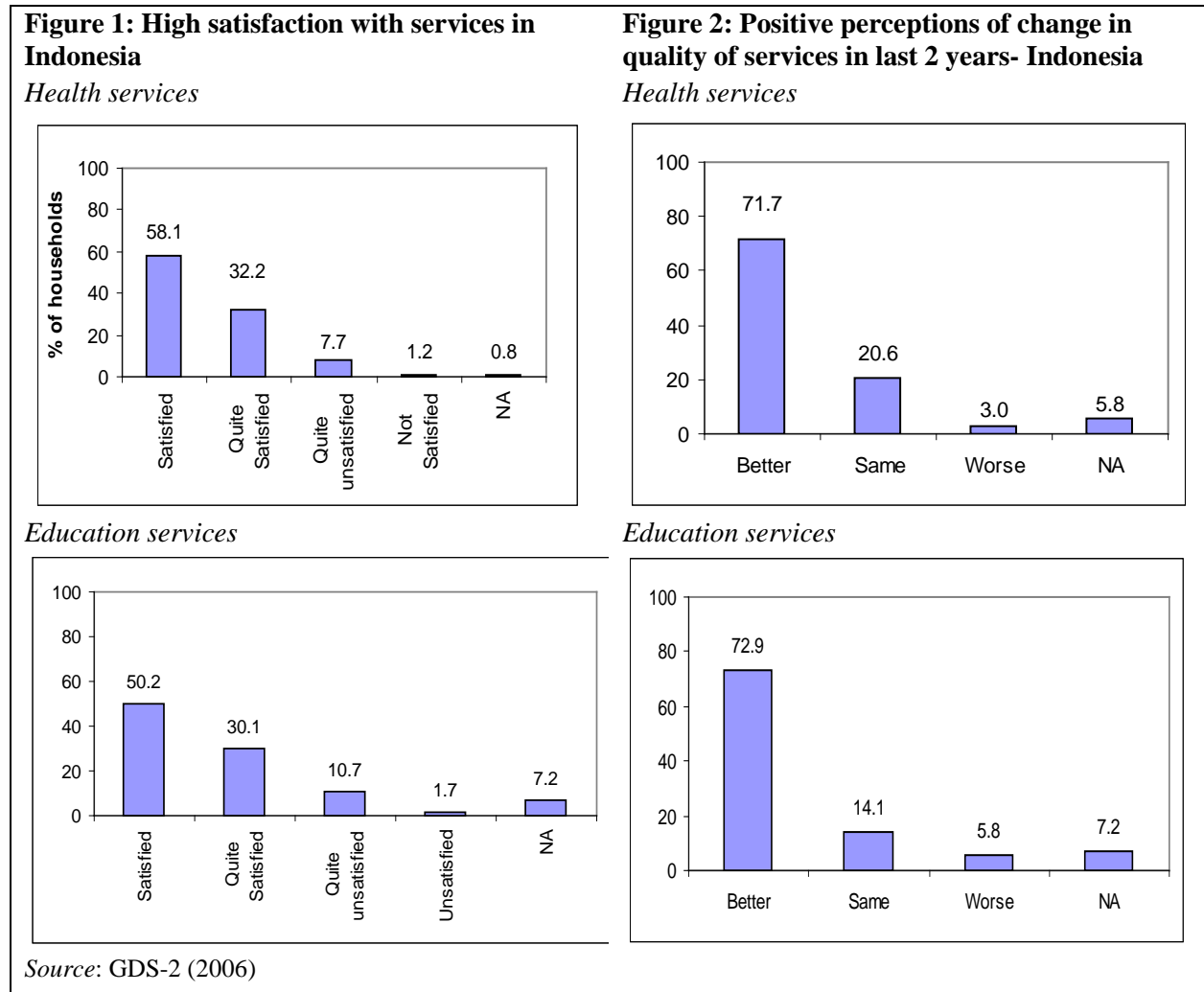
Despite the growing prevalence of surveys administering satisfaction-related questions, there are serious concerns regarding the information content of the data, fueled by results from survey data that often appear puzzling. One example is Indonesia, where the nationally representative GDS-2 household survey reveals extremely high satisfaction with health and education services. More than 90 percent of households report being at least somewhat satisfied with the overall quality of health services (Figure 1), while 72 percent feel that health service delivery has improved in the last 2 years (Figure 2). For education services, more than 80 percent report being at least somewhat satisfied and 73 percent report improvement in the last 2 years.

This happy picture is quite inconsistent with the poor reputation of health and education services in Indonesia, which is also supported by more objective measures of quality from surveys. Such inconsistency, along with the apparent lack of variation in the response to the satisfaction question for two different types of services (education and health) seems to limit the usefulness of the GDS-2 data on satisfaction. High reported satisfaction has been attributed more to cultural norms or social pressure rather than the superior quality of service delivery in Indonesia. The problem with the apparent lack of variation in Indonesia satisfaction data is not

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<sup>5</sup> See, for instance, Ahmad et al. (2005) and Grindle (2007).

unique to Indonesia, but nor is it universal. High variation in satisfaction with education and health services among respondents is seen, for example, in a number of countries where Core Welfare Indicators Questionnaire (CWIQ) surveys have been administered.<sup>6</sup>



Researchers and policymakers alike have long harbored doubts regarding the accuracy of perception-based measures of quality, due to the subjective nature of these instruments (e.g. Bertrand and Mullainathan, 2000). The absence of a common baseline against which respondents' ratings can be benchmarked makes interpreting these data difficult and comparing data-points across regions and countries even trickier. These problems may explain, for example, why respondents from citizen report card surveys in the Indian state of Bihar have reported

<sup>6</sup> In Pakistan, a survey (2006-07) based on CWIQ with a district-representative sample of 73,000 households showed satisfaction rates of 35 and 61 percent for government basic health facilities and schools, respectively. A CWIQ survey in Sierra Leone (2007) yielded satisfaction rates of 38 and 42 percent among those attending primary and secondary schools respectively.

higher levels of satisfaction with schooling than those in Kerala, even though Kerala vastly outperforms Bihar in most measures of access to and quality of public education and education outcomes.

Support for skepticism about perception-based measures of quality can be found in several studies demonstrating little or no correlation between objective indicators of quality and satisfaction levels (Brown and Coulter 1983; Stipak 1979). Other studies, such as Deichman and Lall (2003), Kelly and Swindell (2000) and Parks (1984), show a statistically significant correlation. But studies have shown that factors *other* than quality also influence satisfaction, including demographic factors like age, gender, education, income and ethnicity, as well as attitudes and predispositions related to political beliefs, consumer expectations or past experiences (see Amin et al, 2008 for a fuller discussion). Many of the demographic factors may be easy to observe and control for, but others such as expectations, experiences and predispositions are harder to measure or proxy. This makes it difficult to isolate the impact of quality on satisfaction and makes the interpretation of satisfaction data a complex exercise.

These problems have led many to argue that perception-based instruments may be useful for initiating public debate about government performance and enhancing accountability, but not for measuring actual quality of public services. This paper examines if this is true in the Indonesian context, using GDS-2 data. This survey is uniquely suited for such analysis, given that it is one of those rare instruments that provide data on satisfaction of households along with (from a facility level survey) objective indicators of quality of the facilities the households are using. The analysis also sheds some light on how satisfaction data can be used and interpreted as a measure of quality – a complex question for all the reasons discussed above.

Finally, our detailed analysis of the determinants of satisfaction will also shed some light on a question likely to be of interest to policymakers in Indonesia: what are the specific *dimensions* of quality that seem to matter more than others for user satisfaction? For obvious reasons, indicators of satisfaction would be unable to address this question by themselves. The unique opportunities offered by GDS-2 allow us to address this question in a framework that corrects for some of the most typical problems in using and interpreting satisfaction data.

### ***III. Description of Governance and Decentralization Survey round 2 (GDS-2)***

The second round of GDS was conducted from May to September 2006, to assess the state of governance and local public service delivery in Indonesia by collecting data on quality and satisfaction from households, communities, and facilities. The GDS-2 household sample is nationally representative, selected using a stratified random sampling approach. A total sample of 8544 households were distributed equally among 1068 hamlets (dusun) that served as the primary sampling unit (PSU), which were in turn distributed between 89 districts (kabupaten/kota), 267 sub-districts (kecamatan) and 534 villages.<sup>7</sup> The sample of health and education facilities was not selected at random, and was instead guided by which facilities were reported as most frequently used by households.

For health services, the 6 community health centers (puskesmas) that were most frequently mentioned by surveyed households were selected for secondary data collection within each district included in the survey. Excluded from the facility survey sample were private facilities, public general hospitals and the ancillary facilities (known as the pustu, polindes, and pusling) that form the extended network supporting the main puskesmas. Out of 8,544 households, 4,358 use puskesmas and its related networks. Of these, facility/secondary data are only available for facilities used by 2,269 households (see Table 1), since the less frequented puskesmas and most of the affiliated facilities were excluded from the facility sample.

Education facilities were selected for secondary data collection (through a facility survey) in a way similar to that for puskesmas. The most frequently used public elementary school in a village was selected based on information from interviews with households and the heads of the two hamlets sampled in each village. Similarly, the most frequently used public junior high school in each sub-district was selected based on interviews with households in the two villages sampled in each sub-district and the two hamlet heads for each village. 5,877 households have children of school age (6-19) – a necessary pre-condition for using schools. Among them, facility/secondary data are available for schools used by 2955 households, including 503 households using non-public institutions (see Table 2).

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<sup>7</sup> 89 districts (kabupaten/kota) were randomly selected from the 408 that remained after excluding all districts in Aceh and Jakarta, and the 3 districts used for pre-testing. Three sub-districts (kecamatan) were randomly selected from each district using probability proportionate to size sampling; the same method was used to randomly select 2 villages (desa) within each sub-district; and 2 hamlets (dusun) were randomly selected within each village. Latest population lists provided by the hamlet heads were used to randomly select 8 households in each hamlet.

Data on *both* household satisfaction and objective measures of facility quality are available for only 52 percent of households using public health facilities and 57 percent of households using public education facilities. The partial overlap constrains our ability to analyze the relationship between satisfaction and quality of public facilities. The fact that the selection of the facilities was not random and followed some rule set up by the surveyors is an added source of concern, which we attempt to correct for in our regression model. Between the two types of public services the problem is more acute for health facilities, possibly because there are a much larger number of types of health facilities than schools, leading to a much wider variety of choices that the method of selection of facilities does not take into account.

<i>Type of health facility</i>	<i>Facility/secondary information</i>		<i>Total</i>
	<i>Not Available</i>	<i>Available</i>	
<i>Puskesmas and ancillary facilities</i>	2,089	2,269	4,358
Puskesmas	613	2,253	2,866
Pustu	1,242	15	1,257
Polindis	212	0	212
Pusling	22	1	23
<i>State General hospital</i>	333	3	336
<i>Private hospital</i>	198	0	198
<i>Private clinic</i>	138	0	138
<i>Private doctor</i>	800	4	804
<i>Private midwives</i>	1,299	1	1,300
<i>Private nurse</i>	1,030	0	1,030
<i>Never used</i>	117	0	117
<i>No information for most frequented facilities</i>	NA	NA	263
<b>Total</b>	<b>6,004</b>	<b>2,277</b>	<b>8,544</b>

*Note:* 2269 households that reported Puskesmas and ancillary facilities as the most frequently used facilities for which facility data was available were used for the analysis  
*Source:* GDS-2 (2006)

<i>Type of education facility</i>	<i>Facility/secondary information</i>		<i>Total</i>
	<i>Not available</i>	<i>Available</i>	
<b>Public facilities</b>	<b>1,870</b>	<b>2,452</b>	<b>4,322</b>
Public Elementary	1,008	1,410	2,418
Public Junior High	484	659	1,143
Public Senior High	345	354	699
Public Diploma/College	33	29	62
Private Elementary	319	1	320
Private Junior High	154	4	158
Private Senior High	104	1	105

Private Diploma/College	9	0	9
Other	466	497	963
Total	2,922	2,955	5,877
<i>Source: GDS-2 (2006)</i>			

#### IV. Motivation for our empirical model

As mentioned earlier, average satisfaction with government health and education facilities is surprisingly high in GDS-2. Among the five options households were given (1=Satisfied, 2=Quite Satisfied, 3=Quite Unsatisfied, 4=Unsatisfied, and 5=NA or Unknown) for rating the performance services, option 1 or 2 was chosen by around 90 and 80 percent of households for health and education services respectively. In order to examine the information content of the satisfaction data, it is first necessary to determine whether there is any meaningful *variation* in the data.

We find that while there is little variation in satisfaction versus dissatisfaction, there is substantial variation within the level of satisfaction reported (“Satisfied” versus “Quite Satisfied”). Therefore, it appears that useful information can be extracted from satisfaction data by focusing on *variations from the mean* (of the distribution of response), rather than the precise description of the options. Extending this method further, one would examine the determinants of the variation from the mean response, as opposed to the determinants of satisfaction or dissatisfaction.

Although most respondents in GDS-2 reported being “satisfied”, many of them chose the unequivocal response “Satisfied” versus the lower, more qualified option “Quite Satisfied”. To capture the variation, we define our dependent variable as a binary indicator of satisfaction (S) where all those who chose 1 is classified as “Satisfied” and everyone else as “Dissatisfied”. Table 3 shows the distribution of S for health and education services.

<i>Binary variable</i>	<i>Health services</i>	<i>Education services</i>
$S = 1$	58.1%	50.2%
$S = 0$	41.9%	49.8%
<i>Total</i>	100	100
<i>Note: S=1 if code=1; S=0 if code=(2,3,4,5)</i>		
<i>Source: GDS-2 (2006)</i>		

$$\text{Satisfaction (S)} = \begin{cases} 1 & \text{if satisfied (code = 1)} \\ 0 & \text{otherwise (codes = 2,3,4,5)} \end{cases}$$

Our next step involves devising a robust model for interpreting and evaluating the data on satisfaction. Most analyses of satisfaction data begin by comparing objective indicators of quality of service delivery with satisfaction levels. Recognizing that objective quality is rarely a

sufficient explanation of satisfaction (Stipak 1979), many of these models incorporate the role of expectations, pre-dispositions and perceived quality in determining satisfaction (Serra 1995; DeHoog et al 1990; Van Ryzin 2004).

A commonly-used model is the expectancy disconfirmation theory (Cardoso 1965; Deichmann and Lall 2003; Oliver 1980, 1997), where satisfaction is determined by the degree to which objective performance of service providers meets the expectations of consumers. Where positive disconfirmation occurs (performance surpassing expectations) households are satisfied; conversely, negative disconfirmation leads to dis-satisfaction. The performance model is a more dynamic variant of the disconfirmation model, where consumer expectations are constantly recalibrated based on recent experiences of service use (Boulding et al 1993; Johnson et al 1995). Satisfaction is therefore a result of expectations and actual service delivery quality, which are determined by both household characteristics and by past consumption of services.

This approach can be implemented if data on satisfaction can be successfully matched with data on actual service delivery and expectations. Models based on this approach tend to ignore the difficulty of measuring both objective quality and consumer expectations when it comes to basic services, and do not adequately account for the role of governance in determining satisfaction. Another important drawback of such models is their inability to account for *sample selection bias*, related to the decision of a user to opt for a particular service facility. To correct for this problem, satisfaction data from respondents must be matched with objective data from the facilities they visit only *after* the factors that determine their choice of a facility or service are taken into account.

Selection bias would be more of a concern in analyzing satisfaction with (and usage of) basic services, as opposed to utilities. Basic utilities like water or electricity tend to be universally used and often have single providers servicing entire areas, with limited scope for users to exercise choice. In the case of basic services such as health and education these conditions are less likely to hold. This increases the likelihood of selection bias and makes the typical approach of matching residents' satisfaction with the services available in their area with objective data from public service providers problematic.

Typically, two main sources of sample selection bias are self-selection by users into the sample, and non-random sample selection decisions by data analysts and survey administrators. Satisfaction surveys often suffer from both these problems and this is true for GDS-2 as well. As

seen above, GDS-2 collects data from the most frequented public health and education facilities in each district. Self-selection bias occurs for health facilities because the households choosing the highly frequented facilities may systematically differ from households that are non-users of health services, or utilize facilities not included in the sample. Similarly, households choosing surveyed public schools may systematically differ from those not using schools in the facility sample (for example, the users of private schools, as shown by evidence from many countries<sup>8</sup>). That the survey is restricted to the most frequently used facilities instead of a random sample of all available facilities adds to the bias. In addition to being biased, the matched samples for both education and health are also significantly smaller than the original household sample.

To address these issues, a model to identify the determinants of satisfaction is presented in the next section, using the restricted sample of households who can be matched with the objective data for each type of facility. This is a two-stage Heckman selection model (see Heckman, 1979) that corrects for selection bias and takes into account the role of expectations in determining satisfaction, as well as the impact of the institutional and governance environment. Before that, we summarize below the results from a heuristic model examining the correlation of household demographic characteristics with satisfaction across all households, separately for health and education. The simple model is useful in illustrating the range of factors – that the service providers have no control over – influencing satisfaction with services among households.

### **A simple heuristic model of household demographics and satisfaction**

The simple model uses an ordinary least squares regression of the binary variable for satisfaction ( $S$ ) defined earlier on key socio-economic and demographic characteristics of households and communities, using the full sample of GDS-2 households. Independent variables include household characteristics such as education, gender, age, ethnicity, and religion, and district level characteristics such as location (urban versus rural) and wealth (rich versus poor districts). We restrict ourselves to characteristics that service providers have little control over. Other possible determinants of satisfaction, such as objective quality of services and the role of governance are omitted for now.

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<sup>8</sup> For example, Lankford et al (1995) shows that socio-economic characteristics, including income and parental education and family composition, along with the location of a household and school characteristics, influence strongly the choice between public and private schools in the United States.

***Satisfaction with health services.*** The results reveal that certain household characteristics have a statistically significant correlation with reported satisfaction (for a more detailed discussion, see Amin et al, 2008). These include gender of the head of household, religion of the respondent, ethnicity of respondents, the education level of respondents and household composition. Respondents in rural districts are less likely to be satisfied with public health facilities they frequent compared to those in urban districts. Including village fixed effects (that are expected to control for peer effects or the influence of prevalent social norms at the village level) reduces the power of ethnicity as an explanatory variable for satisfaction, indicating that ethnic groups tend to be concentrated by village and the correlation between satisfaction and ethnicity is mainly due to village-specific characteristics (see Table 4).<sup>9</sup>

The results are similar when the list of explanatory variables is expanded to include households' access to information regarding responsiveness to complaints and the existence of corruption and bribery (see Table 5 for results with village fixed effects).<sup>10</sup> In addition, households are less likely to be satisfied with health services when they know about complaints delivered to government, but are more likely to be satisfied when they know that there was government follow-up in response to the complaints. However, these results should be treated with extra caution – because of the likelihood that access to information on government responsiveness is not an exogenous household characteristic, but is instead endogenous to or influenced by perceived quality of services (that in turn influences satisfaction). Having information on corruption or bribery in health sector does not seem to influence satisfaction. Among information sources, getting information from television is correlated with higher satisfaction; the coefficient however becomes insignificant when village fixed effects are included.

***Satisfaction with education services.*** As in the case of satisfaction with health facilities, satisfaction with education facilities is also significantly correlated with certain household characteristics. These are the education level, religion and ethnicity of respondents, whether the head of the household lives in the village, whether there is a civil servant in the family and household composition. Respondents in rural districts are less likely to be satisfied with public

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<sup>9</sup> For results without village-specific fixed effects, see Amin et al (2008).

<sup>10</sup> For results with information variables but without village-specific fixed effects, see Amin et al (2008).

schools compared to those in urban districts. Including village fixed effects tends to reduce the power of religion and ethnicity as an explanatory variable (see Table 4).

The above results are similar when the list of explanatory variables is expanded to include the variables related to information (see Table 5 for results with village fixed effects).<sup>11</sup> Just as in the case of health facilities, households are less likely to be satisfied with schools when they know about complaints, but are more likely to be satisfied when they know that there was a follow-up in response to the complaints. In this case however, unlike what was seen for health, information about corruption and bribery in education is strongly associated with lower satisfaction. As before, these results should be treated with extra caution, because of the likelihood that these types of information may be endogenous to perceived quality of services, and therefore, satisfaction. Getting information primarily from television or newspaper (as opposed to radio) is associated with higher level of satisfaction with education facilities. These effects are weaker, but still significant when village fixed effects are introduced – implying that while information source is somewhat village-specific, sources of information do influence satisfaction with education facilities.

#### ***V. A modified expectations disconfirmation model***

The simple model above is useful in illustrating how demographic and socio-economic characteristics, which service providers have little control over, influence satisfaction. These factors therefore need to be taken into account in interpreting satisfaction data from households. However, a more accurate analysis of the determinants of reported satisfaction will require modeling the determinants of satisfaction levels, *after* taking into account the facility choice of the household. To correct for the selection bias likely to constrain conventional models for explaining satisfaction, we propose a revised model where: (i) household and community level factors determine the *choice* of the particular (health or education) service provider; (ii) *conditional* on the choice of a service provider, reported satisfaction with the service facility is a function of the actual quality of the service and governance.

In essence, this is a modification of the standard expectancy disconfirmation model mentioned earlier by using a two-stage Heckman selection model to correct for selection bias. The model corrects for the fact that the sample of households for which we have corresponding

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<sup>11</sup> Regression results without village-specific fixed effects are available upon request.

facility data is defined non-randomly through a combination of self-selection and the method of sample selection in GDS-2.

The first stage selection equation predicts the *propensity* of households to use a (health or education) facility for which objective data on quality are available. The second stage outcome equation examines how *satisfaction* ( $S$ ) varies with various indicators of quality and governance, conditioned on the selection of the facility. Studies suggest that district wealth may be an important determinant of satisfaction, which is often attributed to a difference in expectations between the residents of rich and poor districts.<sup>12</sup> To take into account these differences, we run these models separately for samples from poor and rich districts, and in a pooled sample with all districts.<sup>13</sup>

### **Satisfaction with health services: results from two-stage Heckman model**

*The first-stage selection model.* Our selection model posits that expectations play a role in the selection of the type of facility, rather than in ultimate satisfaction with the facility. In the absence of a single, readily-identifiable indicator for expectations, we proxy these with a range of household and community characteristics (similar to those included in our heuristic model), such as gender, age, education levels, religion, household expenditure, social status, employment, household size, composition of household, and ethnicity. In addition, we also include other factors likely to affect choice of facility: whether the health facility (puskesmas) is located within the village or not, whether respondents possess information regarding bribery and corruption, and the sources of that information. District wealth, rural-urban designation, and provincial location of the district are also included to take into account the effect of location/spatial factors of a household on facility choice.

The dependent variable is a binary variable that takes the value 1 if the household uses a public health facility for which facility data is available, and 0 otherwise. Out of the total household sample of 7,686 households used for the regression, the dependent variable takes the value one for 2,064 households. See [Table 6](#) for the detailed results; the equations describing the selection model along with the definitions of variables can be found in the Appendix.

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<sup>12</sup> For example, Duffy (2000) finds that there are few services that deprived area residents are less satisfied with compared to their counterparts in less deprived districts.

<sup>13</sup> We define rich and poor districts using gross regional domestic product (GDRP) per capita for each districts. The bottom two quartiles of all 88 districts with respect to GRDP per capita are defined as poor districts, while the top two quartiles are defined as rich districts. Like all sample selection models, our model is highly sensitive to specification error.

**Key results.** Demographic characteristics play an important (and statistically significant) role in influencing whether or not a puskesmas is the facility of choice for a household. Respondents who belong to male-headed households, are Christian or belong to “other” minority religions, or were born in the villages in which they now live are more likely to use puskesmas. Propensity to use puskesmas increases with age. Males within each age cohort have a higher propensity to use puskesmas compared to their female counterparts. Respondents with primary education or higher education are less likely to use puskesmas. Usage declines with increases in monthly consumption or employment. Belonging to an elite household does not have a statistically significant effect on reducing selection of puskesmas. Interestingly, the location of the puskesmas within the village is strongly correlated with a *lower* propensity to use puskesmas – a trend that holds true for rich and poor districts alike when examined separately.

Demographic and socio-economic characteristics are far more important determinants of facility choice in poor districts than in rich districts. Poor districts exhibit most of the same correlations with demographic and socio-economic characteristics as the pooled sample. For rich districts, the only demographic and socio-economic factors that affect choice of facility are age, belonging to “other” minority religions rather than being Muslim, household consumption level and certain types of household composition. Geographic location seems to matter for puskesmas use in both samples: relative to households in Java, households belonging to other regions are more likely to use puskesmas, with some differences between rich and poor districts. Propensity to use puskesmas is higher for urban households in rich districts and the pooled sample, but not in the poor districts.

Interestingly, selection of puskesmas does not vary significantly with a household’s relative position in society or the extent to which a household has access to information, in the disaggregated samples as well as in the pooled sample.<sup>14</sup>

An important caveat to the first-stage results is that they explain the choice of a certain type of public health facility (puskesmas) for which *facility data is available*, which is not equivalent to the choice of any public health facility (*vis-à-vis* other providers). As Table 1

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<sup>14</sup> The household’s status in the community characteristic is proxied by the indicator “elite” (see Appendix for details). Access to information is proxied using awareness of the existence of health facilities, access to information regarding the existence and content of kelurahan budgets and development plans, and knowledge of complaints delivered, corruption or bribery.

shows, public health facility data is available (and can be matched with) with only about half of the households who use such facilities.

***The second stage model.*** This equation estimated in the second stage (see Appendix) examines how the binary variable of satisfaction (S) with health facilities varies with objective quality and with the governance environment within which health services operate. We find that once we have conditioned for puskesmas selection, satisfaction varies significantly with various indicators of objective quality and governance.

Quality of puskesmas is modeled using four aspects of service delivery: (a) the *coverage* area of the facility; (b) the types of medical *support* provided; (c) the quality of *services* in terms of human resources and medical supplies; and (d) facility *infrastructure*. Principal component (PC) analysis is used to identify, for each of these categories, a single index that is a vector of multiple indicators from the facility surveys. Each index (with a mean of 0 and a standard deviation of 1) is the first PC and increases with higher levels of quality (see Appendix for the details on each index).

Institutional and governance environment in which health services function is captured by the following indicators derived from the household survey (see Appendix): (a) *voice* (proxied by the willingness to complain), (b) *level of accountability* (proxied by government responsiveness to complaints), and (c) an index of *political participation* in the administration of health services.<sup>15</sup>

***Key results.*** After conditioning on the choice of service provider, a strong correlation is found between satisfaction and service quality, with certain dimensions of quality playing an important role. *Firstly*, satisfaction is significantly correlated with the level of *support* available to the main puskesmas from ancillary facilities, for the pooled random sample and the rich- and poor-district samples. *Secondly*, the quality of service care provided, measured in terms of human personnel and medicinal inputs, is another important determinant of satisfaction for the random sample and poor districts, although it does not have a significant impact in rich districts. But interestingly, the quality of infrastructure has little impact on satisfaction in all three samples. Thus citizen satisfaction with health service delivery, particularly in poor districts,

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<sup>15</sup> We recognize that these governance indicators may be endogenous with perceptions of quality and satisfaction. In the absence of good instrumental variables for governance, treating these as exogenous is our most viable option.

seems to respond more to the availability of ancillary facilities to support the main puskesmas, human personnel and medicines, rather than infrastructure.

A number of studies have indicated that local political efficacy and governance factors affect satisfaction with services (including DeHoog et al, 1990 and Licari et al, 2005). We find that while households in poor districts are likely to be more satisfied when there are higher levels of *political participation* in the administration of health services, households in rich districts are only satisfied when health services are *responsive to complaints*. As one would expect, households that complained about health services, whether they belong to the pooled random sample, poor or rich districts, are systematically less likely to be satisfied with health services. However, although the *complaint* indicator is, to some degree, a measure of voice, it may not be exogenous since it can easily be an outcome of (lack of) satisfaction, rather than a determinant.

Finally, the regional location of a household does not appear to be an important factor in determining satisfaction with public health facilities. Location in only one region (Sumatra) seems to have a negative and significant effect on satisfaction compared to the reference region Java. Regional location has no effect on satisfaction with public health facilities in poor districts, while the negative effect is seen for two regions (Sumatra and Sulawesi) for rich districts.

### **Satisfaction with education services: results from two-stage Heckman model**

*The first-stage selection model.* The selection model for the choice of public education facility (school) is similar to that for health facilities. One difference is that unlike in the case for health services, here we do not include a variable for whether the school is located within the village or not. The dependent variable in this case is a binary variable that takes the value 1 if the household sends a child to a public school for which facility data is available, and 0 otherwise. The sample is restricted here to households that have at least one child of school age. Out of 5599 households in the sample for the first-stage regression, the dependent variable takes the value one for 2,595 households. See [Table 7](#) for the detailed results.<sup>16</sup>

*Key results.* Demographic and socio-economic characteristics play some role in influencing the choice of a particular public school for a household, but less than it does for the choice of puskesmas. The longer a household has stayed in the village, and higher the proportion of female children of 6-12 years and male children of 13-19 years in a household, higher is the

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<sup>16</sup> As before, the equations describing the selection model along with the definitions of variables can be found in the Appendix.

likelihood of sending children to public schools. These trends are however not seen for poor districts. Compared to Muslims, households belonging to minority religions are less likely to send their children to public schools, and this is true for the disaggregated samples as well. Unlike in the case of health facilities, choice of public school is not correlated with education level of household head or employment status. Interestingly, better-off households in richer districts are significantly less likely to send their children to public school, while the opposite is seen for the poor districts. One possible explanation for this may be higher availability of other options for schooling (private schools) in richer districts that the better-off are able to afford.

Importantly, households with better information about village level activities are significantly more likely to send their children to public schools. When the head of the household is a community representative, the household is significantly more likely to send a child to a public school. But association of the households with the “elite” is associated with less likelihood to send children to public schools for the pooled sample and the poor districts, while having no effect for rich districts.

As in the case of choice of puskesmas, regional location of households matter for the likelihood of using public schools. Relative to households in Java, households belonging to other regions are more likely to send their children to public schools; the correlation is stronger for households in rich districts than in poor districts.<sup>17</sup> Households from rural areas are significantly more likely to send their children to public school in the pooled sample. This pattern is strong in rich districts but absent in poor districts.

Thus demographic and socio-economic characteristics seem to matter less for the choice of schools than for puskesmas, with the exception of a few – like those related to household composition, household income/expenditure and religion – that are important for both. On the other hand, access to information and social status of households seem to matter for schooling choice and not for the choice of health facilities. For the choice of schools and health facilities alike, the regional location of the household appears to play a key role. While it is impossible to explain these patterns based on the analysis so far, it does confirm that a household’s school choice is the result of a very different decision process from its choice of medical care. This also

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<sup>17</sup> In the rich-district sample, households in all 4 regions (Kalimantan, NTT, Sulaweshi and Sumatra) are significantly more likely to use public schools than those in Java. But for poor district households, location in just 2 regions (NTT and Sumatra) matter relative to location in Java.

implies that the determinants of satisfaction with services are likely to be quite different across health and education.

As in the case of health facilities, the results explain the households' choice of public schools for which *school facility data is available*, and not the choice of public versus non-public school. This distinction is important, especially since as Table 2 shows, school facility data is available (and can be matched with) with only 56 percent of households in the sample who send a child to public schools.

***The second stage model.*** Just like in the case of health facilities, we find that after conditioning for the selection of schools, satisfaction (the binary variable S) varies significantly with various indicators of objective quality and governance.

Quality of public schools is proxied using the following aspects of service delivery (see Appendix for a more detailed description): (a) the extent of *participatory decision-making* in school; (b) quality of *infrastructure* in school; (c) the quality of *teaching staff*; (d) coverage and implementation of the School Operation Assistance Program (BOS);<sup>18</sup> (e) *student* performance; and (f) *coverage* of students by the school (the size of enrollment and rate of attendance). For each of these categories, principal component analysis is used to identify an index derived from multiple indicators provided by the facility surveys (see Appendix for detailed descriptions of each index).

Institutional and governance environment in which public schools function is captured by the following indicators (from the household survey): (a) *information* available to households about bribery and corruption in education, (b) *voice* (proxied by the willingness to complain against education service providers) and (c) *level of accountability* (proxied by government responsiveness to complaints).

***Key results.*** After conditioning on the choice of public school (selected for the facility survey), a strong correlation is found between satisfaction and certain dimensions of school quality. Moreover, the factors that influence satisfaction and the pattern of differences between rich and poor districts can provide important clues to policymakers about which aspects of quality to focus on to improve user satisfaction with schools.

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<sup>18</sup> BOS stands for “Bantuan Operasional Sekolah” program. It is a school grant program administered by the central authority targeting non-salary operational expenditures of schools.

*Firstly*, satisfaction of users is significantly higher when the decision-making for school's mission and vision is participatory – taken jointly by school principal, teachers and the community. The positive association between satisfaction and participatory decision-making is higher for the rich districts than for the overall population, and non-existent in poor districts.

*Secondly*, better infrastructure facilities in schools (e.g. condition of classrooms, availability of books, library rooms, sports hall, computer rooms) is associated with significantly higher level of satisfaction in poorer districts, but has no effect on richer districts or for the pooled sample. A possible explanation for this is that the schools in poor districts lag in facilities compared to the average, which leads to households in poor districts placing a premium on school facilities, whereas those in other areas focus on other aspects of quality.

*Thirdly*, the coverage of a school by the BOS program and the extent to which the implementation of BOS has progressed has positive and significant effect on the level of satisfaction. Disaggregating samples, the “BOS effect” on satisfaction is significant in rich districts but not in poor districts.<sup>19</sup>

Interestingly, teacher quality (in terms of experience, number and student-teacher ratio) seems to have no significant effect on household's satisfaction. Also, satisfaction is just weakly correlated with student characteristics – increasing with better student performance in richer districts and with the extent of enrollments and attendance in schools in poorer districts. These results and those on the availability of school facilities (see above) seem to suggest that users in poor districts are more concerned with the basic features of a school (e.g. facilities in the building, enrollments and attendance of students in a school), whereas in other districts satisfaction is influenced by factors reflecting more “second-generational” issues, like reforms related to school-based management or participatory decision-making.

Among the variables proxying governance and institutional environment of schools, knowledge of bribery and corruption in education and complaints against schools have significantly negative effects on satisfaction. The negative impact of corruption is strong in rich districts but absent in poor districts, while the exact opposite is true for the negative impact of complaints. Households in poor districts are significantly less likely to be satisfied when there

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<sup>19</sup> Coverage of BOS refers to the adequacy of BOS allotment and number of students covered in BOS. The features of BOS include preparation of the school's development plan and budget, implementation of school based management system, dissemination of required information through adequate socialization of the program and number of disbursements.

are complaints, but respond positively when the provider is responsive to complaints (implies satisfactory following up and managing of criticism and suggestions by citizens).

The regional location of a household is an important factor in determining satisfaction with public schools, with the effect being particularly strong for poor districts. Location in three regions (all except NTT) has a significantly negative effect on satisfaction compared to Java region. The negative effect of the three regions is strong for poor districts but absent for rich districts.

*Comparing health and education results.* Thus for health and education alike, satisfaction with facilities is significantly correlated with various objective measures of quality of a facility, as well as with indicators of governance and institutional environment of the facilities. The direction of correlation is as expected (satisfaction positively correlating with quality), which suggests that the satisfaction indicator, in the way we have defined it, has considerable information content.

In spite of the broad similarities, there are important differences between the determinants of satisfaction in health and education facilities. One difference relates to the roles of infrastructure and quality of service. While quality of infrastructure seems to have no influence on satisfaction with health facilities, the quality of school infrastructure is a significant determinant of satisfaction with schools in poor districts. Conversely, while indicators of quality – like availability of personnel and medicinal inputs – are key determinants of satisfaction in health services, teacher quality does not seem to correlate at all with satisfaction in schools.

For both education and health facilities, a more participatory management of the facility seems to induce higher satisfaction among users. There are differences, however, in how the results shift between rich and poor areas. For health facilities, households in *poor districts* are more likely to be satisfied with higher participation in the administration of health services. For schools, households in *rich districts* are more likely to be satisfied when management of schools is more participatory or the implementation of BOS program (implementing a school-based management system) is more advanced. On the other hand, *responsiveness to complaints* about facilities improved satisfaction with health facilities in rich districts only and satisfaction with schools in poor districts only. These results cannot be explained using the analysis done for this paper. They do confirm, however, that the interactions between governance and institutional

environment of public services and satisfaction with services are complex, and may show varying patterns depending on the type of service and the economic status of an area.

Another important difference between health and education is in the role of regional location of a household in determining satisfaction. While regional location matters only marginally for satisfaction with health facilities (and has no effect for poor districts), it strongly influences satisfaction with schools (and particularly so for poor districts). The results suggest that satisfaction with public schools is likely to be much lower in the poorer areas of the Kalimantan, Sulawesi and Sumatra regions compared to the poor areas of Java region, while there are no such differences between the richer areas of these regions. For public health facilities, on the other hand, the regional divide is much weaker with only one region (Sumatra) seemingly lagging behind in satisfaction levels, with no regional difference in satisfaction levels for poor areas.

## ***VI. Conclusion: implications of our results***

Our analysis of data from GDS-2 has useful implications for the design and use of surveys that measure satisfaction levels of users of public services. The analysis shows that proper interpretation of satisfaction data would require finding meaningful variation in satisfaction responses and econometric models that account for selection bias and subjectivity of responses. However, once selection bias and the role of expectations in facility choice have been factored in, the variation in satisfaction level can be highly informative for policymakers and researchers alike.

Satisfaction surveys are likely to remain a popular method for monitoring the quality of services because of the ease of administering such surveys. Thus it is useful to reflect briefly on what our analysis suggests for the design of such surveys, especially in the “second-best” scenario where collecting data from households *and* facilities is not possible for practical reasons.

Firstly, much of the evidence in this paper (supported by others in this literature) suggests that a range of factors other than those related to the quality of facilities play a key role in determining the satisfaction level of households. Thus even in the event that an accompanying facility survey is not a practical option, there are clear benefits in having a satisfaction survey collect as much information on the characteristics of households and communities as possible, including sources of information and social status of a household in the community. This would

allow an analyst to econometrically correct for some of the subjectivity in the satisfaction data. In the absence of such correction, an interpretation of satisfaction data, across space or time, can be misleading.

Secondly, data on satisfaction from a random sample administered at the household level is likely to yield more representative results in most cases than a typical “user survey”, namely a survey of a sample of users of a particular type of facility. A random household sample may allow for satisfaction data to be collected from a representative sample of the country or the region, or allow for the correction of selection bias arising from the household’s choice of a particular type of facility (if satisfaction is reported by only a subset of households using that facility).<sup>20</sup> In contrast satisfaction reported by a sample of users of a particular type of facility can be subject to an undetectable selection bias, which would yield misleading results.<sup>21</sup>

The concern about selection bias in a survey limited to just users is especially applicable for services like health and education that present most potential users with some degree of provider choice. Encouragingly, incorporating questions on satisfaction with basic services in household surveys is becoming increasingly popular. For example, the aforementioned CWIQ surveys, fielded in a large number of countries (mostly in Africa) combine questions on access, usage and satisfaction with basic services with those on household and community characteristics, on a nationally (or regionally) representative sample.<sup>22</sup> In cases where user surveys are the only practical option due to time or cost constraints or because the service is used by a miniscule proportion of the population<sup>23</sup> the data must be interpreted with caution, qualified with the necessary caveats.

Thirdly, our analysis has suggested that even if a large majority of respondents appear to be more or less satisfied (or dis-satisfied), useful information can still be extracted by using the variation in responses rather than the actual responses directly. This method is likely to be helpful to analysts encountering such data for other countries. There are simple implications for

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<sup>20</sup> Note that even in the absence of facility level data, some measures of facility quality and governance/institutional environment of the facility can be collected from the household and/or the community.

<sup>21</sup> For example, if one is comparing satisfaction data from a user survey over time, a change in satisfaction levels may reflect a “real” change, or just may be a result of a changing profile of households opting to use a particular type of facility, with differences in characteristics that influence their satisfaction.

<sup>22</sup> Numerous African countries have had at least one round of CWIQ. Some, including Ghana, Malawi, Mozambique and Rwanda have had more than one round. In Pakistan, two rounds of a survey modified from CWIQ have been fielded in 2004-05 and 2006-07, which measures satisfaction with public services.

<sup>23</sup> For services that are rarely used, like courts in many developing countries, a random household sample will need to be very large to ensure that a reasonable number of users are included, which can be impractical or too costly.

survey design as well. Variation in response is more likely to occur when surveys phrase satisfaction-related questions as multiple-choice questions (as in GDS-2), as opposed to a simple “yes/no” or “satisfied/dissatisfied”. Another way to induce variation in responses is by framing separate questions on satisfaction with *different aspects or features* of a school or health facility (CWIQ surveys usually adopt this approach), as opposed to a single question on satisfaction with education or health services.

Our analysis also sheds light on which aspects of health and education services matter the most for user satisfaction in the case of Indonesia. How these determinants differ across rich and poor districts also suggests differences in priorities among users depending on the economic condition of an area. These results suggest several implications for policy. Firstly, access to ancillary medical facilities supporting the main puskesmas is a universally important determinant of satisfaction, whereas infrastructure and coverage are not. Infrastructure, on the other hand, seems to matter for user satisfaction with public school in poor areas. Local governments seeking to increase satisfaction with health facilities may therefore need to concentrate on increasing the extended network, rather than on the coverage and physical infrastructure of the main puskesmas. On the other hand, improving the infrastructure of schools in poor areas is likely to improve satisfaction levels among parents of students.

Secondly, the results suggest that improving quality of human resource and medicinal inputs can be a potential priority area for the government to improve satisfaction with health services in poor districts. In education, however, indicators of teacher quality and student performance do not seem to matter much for satisfaction. This should not be taken to imply that households do not attach importance to the quality of education offered by a school; instead, it is more likely that these indicators do not reflect the aspects of “quality” the household care most about. The results do suggest, however, that factors *other* than the directly measurable indicators of school quality are important factors influencing satisfaction among parents.

Thirdly, greater degree of community participation in the decision-making processes for facilities and better responsiveness of service providers to complaints appears to improve satisfaction, with the impact varying across rich and poor districts. In education, satisfaction among users is found to be positively correlated with the extent of implementation of the BOS program (e.g. school-based management, allocations of funds to schools, participatory planning and budgeting), which is consistent with the view that increased decentralization of service

delivery improves quality. The indicators related to the participatory decision-making and extent of decentralization may reflect, at least to a partial degree, aspects of “quality” of the school that are valued by users. They may also reflect that households attach a special value to being involved in the management of the facilities. Why these indicators matter for satisfaction, what explains the variations between rich and poor areas, and what that implies for the priorities of a government remain important questions for future research.

Finally, satisfaction with public schools is significantly correlated with the household’s location, with satisfaction levels in poor districts likely to be significantly lower in regions outside of Java. This suggests the need for prioritization in efforts to improve the quality of education, particularly in the poor districts of these regions.

We conclude by noting that the useful results from GDS-2 data should diffuse some of the skepticism regarding the utility of satisfaction surveys. Although satisfaction surveys do not lend themselves easily to direct interpretation, when used with care they can be effective in providing insights to policymakers on the quality of services and citizens’ priorities and for evaluating the impact of reforms such as decentralization. Analysts have a key role to play in interpreting the data using appropriate models and estimation techniques, given the inherently subjective nature of such data.

**Table 4: Satisfaction based on household and community characteristics with village fixed effects**

	(1)	(2)
	<b>Health_satisfaction</b>	<b>Education_satisfaction</b>
Male Household head	-0.040 (2.78)**	-0.003 (0.23)
Age of Head of the household	0.001 (1.17)	-0.001 (1.26)
Education level: up to primary	0.030 (1.57)	0.072 (3.77)**
Education level: up to junior high	0.026 (1.13)	0.056 (2.45)**
Education level: up to higher secondary	0.014 (0.62)	0.046 (2.00)*
Education level: Higher education	-0.020 (0.53)	0.024 (0.60)
Religion dummy: Catholic (Moslem is considered as reference)	-0.079 (1.74)*	-0.052 (1.16)
Religion dummy: Christian	-0.011 (0.26)	-0.054 (1.33)
Religion dummy: other religion	0.056 (0.85)	0.047 (0.76)
Head of the household born in village	0.017 (1.02)	-0.001 (0.04)
Head of the household lives in village	-0.001 (1.03)	0.001 (1.71)*
Log of per capita monthly expenditure on consumption	0.001 (0.12)	-0.001 (0.09)
Having civil servant in family	0.025 (1.10)	0.062 (2.71)**
Association with community elites	0.004 (0.27)	0.002 (0.11)
Employment status: employed	-0.008 (0.51)	-0.014 (0.96)
Household size	0.005 (1.52)	0.005 (1.35)
Family composition: children below 5 years	0.020 (0.33)	-0.090 (1.50)
Family composition: Proportion of male between 6-12 years	0.141 (2.13)*	0.153 (2.32)*
Family composition: Proportion of female between 6-12 years	0.059 (0.89)	0.056 (0.84)
Family composition: Proportion of male between 13-19 years	0.005 (0.07)	0.069 (1.03)
Family composition: Proportion of male between 20-59 years	0.038 (0.62)	-0.079 (1.33)
Family composition: Proportion of female between 20-59 years	0.043 (0.72)	-0.051 (0.86)
Family composition: Proportion of male 60 years and up	0.096 (1.38)	-0.116 (1.69)*
Family composition: Proportion of female 60 years and up	0.022 (0.34)	-0.200 (3.08)**
Dummy for ethnicity=Sunda (Ethnicity=Java is considered as ref)	-0.031 (0.59)	0.020 (0.40)
Dummy for ethnicity =Bali	0.124 (1.35)	0.017 (0.19)
Dummy for ethnicity =Batak	0.036 (0.56)	0.132 (2.01)*
Dummy for ethnicity =Bugis	0.027 (0.52)	0.090 (1.89)*
Dummy for ethnicity =Tionghoa	-0.033 (0.36)	-0.082 (0.86)
Dummy for ethnicity =Madura	0.004 (0.07)	-0.016 (0.20)
Dummy for ethnicity =Sasak	0.162 (1.63)	0.055 (0.61)
Dummy for ethnicity =Minang	0.031 (0.49)	0.068 (1.13)
Dummy for ethnicity =Banjar	0.008	0.011

	(0.15)	(0.20)
Dummy for ethnicity =Bima-Dompu	-0.092	-0.525
	(0.44)	(5.31)**
Dummy for ethnicity =1\Makassar	0.160	0.045
	(0.81)	(0.23)
Dummy for ethnicity =Nias	-0.045	-0.366
	(0.10)	(3.00)**
Dummy for ethnicity =Palembang	-0.047	-0.066
	(0.49)	(0.63)
Dummy for ethnicity =Sumbawa	0.272	0.115
	(1.56)	(0.73)
Dummy for ethnicity =Toraja	-0.065	0.048
	(0.58)	(0.39)
Dummy for ethnicity =Betawi	0.174	0.089
	(1.67)*	(0.81)
Dummy for ethnicity =Dayak	-0.007	-0.001
	(0.12)	(0.02)
Dummy for ethnicity =Melayu-Deli	-0.093	-0.175
	(0.59)	(1.07)
Dummy for ethnicity =Ambon	0.044	-0.101
	(0.47)	(1.07)
Dummy for ethnicity =Manado	0.051	0.004
	(0.57)	(0.05)
Dummy for ethnicity =Others	0.014	0.009
	(0.41)	(0.27)
Dummy for district type: Rich	0.000	0.000
	(0.00)**	(0.00)**
Dummy for location: Perdesaan (Reference=Perkotaan)	0.000	0.000
	(0.00)**	(0.00)**
Constant	0.431	0.471
	(3.33)**	(3.65)**
Observations	8402	8402
Robust z-statistics in parentheses		
<b>* significant at 5% level; ** significant at 1% level</b>		

**Table 5: Satisfaction based on household and community characteristics including access to information  
(with village fixed effects)**

	(1) <b>Health_satisfaction</b>	(2) <b>Education_satisfaction</b>
Male Household head	-0.039 (2.67)**	-0.003 (0.24)
Age of Head of the household	0.001 (1.12)	-0.001 (1.25)
Education level: up to primary	0.027 (1.42)	0.070 (3.63)**
Education level: up to junior high	0.024 (1.06)	0.053 (2.30)*
Education level: up to higher secondary	0.014 (0.63)	0.043 (1.85)*
Education level: Higher education	-0.019 (0.51)	0.026 (0.67)
Religion dummy: Catholic (Moslem is considered as reference)	-0.076 (1.67)*	-0.051 (1.15)
Religion dummy: Christian	-0.009 (0.22)	-0.053 (1.33)
Religion dummy: other religion	0.053 (0.80)	0.039 (0.62)
Head of the household born in village	0.018 (1.05)	-0.001 (0.05)
Head of the household lives in village	0.000 (0.98)	0.001 (1.77)*
Possesses information on kelurahan budget	0.009 (0.44)	0.046 (2.22)*
Possesses information on development plans	0.014 (0.79)	0.015 (0.86)
Possesses information about BPD	0.014 (1.00)	-0.008 (0.56)
Possesses information about delivered complaints	-0.113 (4.17)**	-0.070 (2.69)**
Possesses information about follow up after complaints	0.112 (3.85)**	0.056 (2.00)*
Possesses information about corruption in health	-0.046 (1.21)	
Possesses information about bribery in health	-0.071 (1.29)	
Possesses information on bribery in education		-0.120 (3.72)**
Possesses information on corruption in education		-0.083 (3.12)**
Source of information: radio	0.002 (0.13)	-0.019 (1.59)
Source of information: TV	0.002 (0.10)	0.032 (1.99)*
Source of information: Newspaper	-0.003 (0.17)	0.033 (1.90)*
Log of per capita monthly expenditure on food and non-food items	0.002 (0.21)	-0.001 (0.09)
Having civil servant in family	0.025 (1.10)	0.056 (2.42)**
Association with community elites	0.002 (0.17)	-0.002 (0.15)
Employment status: employed	-0.008 (0.57)	-0.015 (0.99)
Household size	0.006 (1.61)	0.005 (1.43)
Family composition: children below 5 years	0.020 (0.34)	-0.092 (1.54)
Family composition: Proportion of male between 6-12 years	0.143 (2.15)*	0.145 (2.20)*
Family composition: Proportion of female between 6-12 years	0.063 (0.95)	0.047 (0.70)
Family composition: Proportion of male between 13-19 years	0.005 (0.08)	0.063 (0.95)

Family composition: Proportion of female between 13-19 years	0.000 (0.00)**	0.000 (0.00)**
Family composition: Proportion of male between 20-59 years	0.037 (0.61)	-0.086 (1.45)
Family composition: Proportion of female between 20-59 years	0.045 (0.75)	-0.060 (1.02)
Family composition: Proportion of male 60 years and up	0.099 (1.41)	-0.118 (1.72)*
Family composition: Proportion of female 60 years and up	0.026 (0.40)	-0.201 (3.10)**
Dummy for ethnicity: Sunda (Ethnicity: Java is considered as reference)	-0.034 (0.65)	0.020 -0.106
Dummy for ethnicity : Bali	0.126 (1.37)	0.017 (0.19)
Dummy for ethnicity: Batak	0.036 (0.55)	0.129 (1.96)*
Dummy for ethnicity : Bugis	0.028 (0.53)	0.087 (1.85)*
Dummy for ethnicity : Tionghoa	-0.031 (0.34)	-0.080 (0.85)
Dummy for ethnicity : Madura	0.001 (0.01)	-0.031 (0.42)
Dummy for ethnicity : Sasak	0.163 (1.65)*	0.052 (0.58)
Dummy for ethnicity : Minang	0.033 (0.53)	0.064 (1.07)
Dummy for ethnicity : Banjar	0.007 (0.14)	0.012 (0.23)
Dummy for ethnicity : Bima-Dompu	-0.094 (0.45)	-0.532 (5.40)**
Dummy for ethnicity : Makassar	0.180 (0.89)	0.033 (0.17)
Dummy for ethnicity : Nias	-0.034 (0.07)	-0.345 (2.96)**
Dummy for ethnicity : Palembang	-0.048 (0.50)	-0.074 (0.71)
Dummy for ethnicity : Sumbawa	0.284 (1.57)	0.116 (0.72)
Dummy for ethnicity : Toraja	-0.054 (0.47)	0.067 (0.54)
Dummy for ethnicity : Betawi	0.171 (1.66)*	0.093 (0.88)
Dummy for ethnicity : Dayak	-0.007 (0.13)	0.005 (0.09)
Dummy for ethnicity : Melayu-Deli	-0.090 (0.57)	-0.150 (0.90)
Dummy for ethnicity : Ambon	0.049 (0.53)	0.040 (1.14)
Dummy for ethnicity : Manado	0.054 (0.59)	0.008 (0.10)
Dummy for ethnicity : Others	0.017 (0.48)	0.011 (0.31)
Dummy for district type: Rich	0.000 (0.00)**	0.000 (0.00)**
Dummy for location: Perdesaan (Reference=Perkotaan)	0.000 (0.00)**	0.000 (0.00)**
Constant	0.413 (3.17)**	0.463 (3.59)**
Observations	8402	8402
Absolute value of t-statistics in parentheses		
* significant at 5% level; ** significant at 1% level		

**Table 6: Two-stage Heckman selection model for satisfaction with public health facilities (puskesmas)**

<b>Independent variable</b>	<b>Indicators</b>	<b>Random districts</b>	<b>Poor districts</b>	<b>Rich Districts</b>
	<i>Dependent variable: Level of Satisfaction (S=1,0)</i>	<i>Coef.</i>	<i>Coef.</i>	<i>Coef.</i>
Pc <sub>1</sub> _coverage	Index representing coverage	-0.0047	-0.0574*	0.0109
Pc <sub>1</sub> _support	Index representing support	0.027**	0.0636*	0.0228*
Pc <sub>1</sub> _service	Index representing service	0.0194**	0.0384**	0.0085
Pc <sub>1</sub> _infra	Index representing infrastructure	0.0019	-0.0115	0.0085
Pc <sub>1</sub> _participation	Index representing household's participation	0.0099	0.0331*	-0.0056
H_complaint	Complaints made against health service	-0.2353**	-0.1796*	-0.2463**
responsiveness	Index representing service providers responsiveness	0.0802*	0.0418	0.0857*
durban	Dummy for urban area	0.0572*	0.0059	0.0653
	<i>Region dummies (Java is considered as reference):</i>			
Region2	Kalimantan	-0.0298	-0.1429	-0.0182
Region3	NTT	-0.0622	-0.1139	-0.049
Region4	Sulawesi	-0.0616	-0.1797**	-0.0126
Region5	Sumatra	-0.0927**	-0.2247**	-0.073
	Constant	0.4627	0.5529**	0.471**
	<b>Selection model</b>			
Male	Male household head	0.1258**	0.2616**	0.0343
Age	Age of the household head	0.0041*	-0.0042	0.0084**
Edu_pr	Education level: up to primary	-0.0467	-0.1885*	0.0657
Edu_jh	Education level: up to junior high	-0.0037	-0.2889**	0.1496
Edu_hs	Education level: up to higher secondary	-0.0377	-0.2783*	0.1194
Edu_higher	Education level: Higher education	-0.2411*	-0.3065**	-0.1804
Dcatholic	Religion dummy: Catholic (Moslem is considered as reference)	0.1231	0.387*	-0.0495
Dchrist	Religion dummy: Christian	0.1697**	0.2435	0.1501*
Dorel	Religion dummy: other religion	0.2764**	-0.2052	0.2397**
Born_vlg	Head of the household born in village	0.0959*	0.1241	0.0666
Live_vlg	Head of the household lives in village	-0.0011	0.0008	-0.0015
lIPCE_mo	Log of per capita monthly expenditure on food and non-food	-0.1032**	-0.0988**	-0.1611**
Hhmemcs	Having civil servant in family	-0.03	0.1456	-0.0536
Elite	Association with community elites	-0.0827	-0.1044	-0.0636
Employed	Employment status: employed	-0.088*	-0.1825*	-0.0086
Hhsize	Household size	0.0112	-0.0176	0.0245
Pc05	Family composition: children below 5 years	0.4309*	0.6274*	0.3261
Pm612	Family composition: Proportion of male between 6-12 years	0.6214**	1.1129**	0.3602
Pf612	Family composition: Proportion of female between 6-12 yrs	0.5397**	0.8527**	0.3174
Pm1319	Family composition: Proportion of male between 13-19 yrs	0.7892**	0.9272**	0.7188**
Pm2059	Family composition: Proportion of male between 20-59 yrs	0.8434**	1.6606**	0.2846

Pf2059	Family composition: Proportion of female betn 20-59 yrs	0.7822**	1.1753**	0.5376*
Pm60p	Family composition: Proportion of male 60 yrs and above	0.5143*	0.9886**	0.2142
Pf60p	Family composition: Proportion of female 60 yrs and above	0.8238**	0.671	0.8036**
Pus_inside1	Dummy: whether the puskesmas is situated inside the village	-0.5571**	-0.8964**	-0.4246**
Pc1_info	Index representing availability of information	-0.0181	-0.026	-0.0043
Pc1_source	Index representing sources of information	0.0105	-0.0069	0.014
durban	Dummy for urban area	0.2647**	0.1758	0.0504**
<i>Region dummies (Java is considered as reference):</i>				
Region2	Kalimantan	0.3852**	0.416**	0.2749**
Region3	NTT	0.193**	0.2539*	0.5497**
Region4	Sulawesi	0.5017**	0.7032**	0.3006**
Region5	Sumatra	0.2718**	0.7258**	0.0499
	Constant	-0.3656	-0.4162	0.4279
<hr/>				
	Mill's lambda	0.0578	0.0516	0.0435
	Number of observation	7686	3114	4572
	Number of censored observations	5622	2326	3296
	Number of uncensored observations	2064	788	1276
	Wald $\chi^2$	185.57	143.05	92.83
	Prob > $\chi^2$	0	0	0

\* significant at 5% level; \*\* significant at 1% level

Note: Each index represents the first principal component of a set of variables reported in the appendix

**Table 7: Two-stage Heckman selection model for satisfaction with public schools**

<b>Independent variable</b>	<b>Indicators</b> <i>Dependent variable: Level of Satisfaction (1,0)</i>	<b>Random districts</b> <i>Coef.</i>	<b>Poor districts</b> <i>Coef.</i>	<b>Rich Districts</b> <i>Coef.</i>
Pc1_participation	Participatory mode of management	0.055*	0.124**	-0.043
Pc1_facilities	Index of Facilities	0.011	0.002	0.029**
Pc1_teacher	Index of teacher qualities	0.007	0.017	-0.010
Pc1_BOS	Index of BOS coverage	0.017*	0.027*	0.002
Pc1_stud_quality	Index for student performance	-0.009	-0.016	-0.009
Pc1_stud_coverage	Index for student coverage	0.002	0.001	0.026
responsiveness	Responsiveness of the service provider	0.013	-0.027	0.075*
E_complaint	Complaints made (Voice)	-0.087**	-0.063	-0.145**
E_corrupt	Corruption information	-0.100*	-0.169**	-0.018
E_bribe	Bribery information	-0.149*	-0.139	-0.062
durban	Dummy for urban	-0.034	-0.014	-0.015
	<i>Region dummies (Java is considered as reference):</i>			
Region2	Kalimantan	-0.107**	-0.002	-0.214**
Region3	NTT	-0.044	-0.095	-0.080
Region4	Sulawesi	-0.123**	-0.051	-0.208**
Region5	Sumatra	-0.149**	-0.036	-0.432**
	_cons	0.610**	0.496**	0.676**
	<b>Selection model</b>			
feml	Female headed household	0.064	0.045	0.068
Age	Age of the Head of household	-0.002	-0.003	0.000
Edu_pr	HH education level: primary	0.094	0.098	0.075
Edu_jh	HH education level: Junior high	0.110	0.140	0.087
Edu_hs	HH education level: HS	-0.025	-0.007	-0.036
Edu_higher	HH education level: Other higher education	-0.053	-0.067	0.108
Dcatholic	Catholic	-0.507**	-0.306**	-0.610**
Dchrist	Christian	-0.113	-0.121	-0.238*
Dorel	Other minorities	-0.126	0.003	-0.609**
Born_vlg	HH born in this village	-0.077	-0.082	-0.042
Live_vlg	HH live in this village	0.005**	0.006**	0.003
lIPCE_mo	Log of percapita monthly expenditure	0.025	-0.085*	0.086*
employment	HH employment status (Employed=1)	0.053	0.096	-0.039
HHsize	Household size	-0.019	-0.012	-0.017
Pc05	Children below 5 years	0.411	0.814	-0.042
Pm612	Proportion of male between 6-12 years	0.454	1.053**	-0.371
Pf612	Proportion of female between 6-12 years	0.648*	0.981*	0.171
Pm1319	Proportion of male between 13-19 years	0.569	0.953*	0.111
Pf1319	Proportion of female between 13-19 years	0.314	0.689	-0.225
Pm2059	Proportion of male between 20-59 years	0.650*	0.705	0.629
Pf2059	Proportion of female between 20-59 years	0.136	0.030	0.358
Pm60p	Proportion of male 60 years and up	0.499	0.767	0.262
HHmemcs	HH has civil servant in family	-0.060	-0.054	-0.059
Hhmemvh	HH has village head in family	0.111	0.428	-0.684*

Hhmemcrep	HH has community representative	0.212*	0.204	0.177
Hhmemcfig	HH has community figure in the family	0.235	0.116	0.333
elite	HH has association with elite	-0.352**	-0.186	-0.467*
Pc1_info	Index for village level information	0.054**	0.042*	0.061**
durban	Dummy for urban area	-0.417**	-0.510**	-0.047
Pc1_source	Index for sources of information	-0.026	-0.022	-0.063*
	<i>Regions (Java is considered as reference)</i>			
Region2	Kalimantan	0.349**	0.501**	0.126
Region3	NTT	0.158*	0.291	0.263**
Region4	Sulawesi	0.212	0.639**	0.064
Region5	Sumatra	0.262**	0.329**	0.367**
	_cons	-0.882*	0.100	-1.308*
Mills lambda		-0.027	-0.049	0.053
Number of observation		5599	3208	2391
Censored observation		3004	1704	1300
Uncensored observation		2595	1504	1091
Wald $\chi^2$		252.570	241.370	112.600
Prob > $\chi^2$		0.000	0.000	0.000

\* significant at 5% level; \*\* significant at 1% level

Note: Each index represents the first principal component of a set of variables reported in the appendix

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## Appendix

We use the following model for our analysis of satisfaction with health facilities:

### Stage 2 : Regression model

$$\text{health\_s} = \alpha_{i0} + \alpha_{i1}\text{pc1\_coverage} + \alpha_{i2}\text{pc1\_support} + \alpha_{i3}\text{pc1\_service} + \alpha_{i4}\text{pc1\_infrastructure} \\ + \alpha_{i5}\text{pc1\_participation} + \alpha_{i6}\text{h\_complaint} + \alpha_{i7}\text{responsiveness} + \alpha_{i8}\text{durban} + \alpha_{i9}\text{region} + u_{i2}$$

### Stage 1 : Selection model

$$\text{obj\_pus} = \gamma_{0i} + \gamma_{1i}\text{edu\_pr} + \gamma_{2i}\text{edu\_jh} + \gamma_{3i}\text{edu\_hs} + \gamma_{4i}\text{edu\_higher} + \gamma_{5i}\text{dcatholic} + \gamma_{6i}\text{dchrist} + \gamma_{7i}\text{dorel} \\ + \gamma_{8i}\text{male} + \gamma_{9i}\text{age} + \gamma_{10i}\text{born\_vlg} + \gamma_{11i}\text{live\_vlg} + \gamma_{12i}\text{employed} + \gamma_{13i}\text{hhszize} + \gamma_{14i}\text{IPCE\_mo} \\ + \gamma_{15i}\text{hhmemcs} + \gamma_{16i}\text{elite} + \gamma_{17i}\text{pus\_inside1} + \gamma_{18i}\text{pc1\_info} + \gamma_{19i}\text{pc1\_source} + \gamma_{20i}\text{pc05} \\ + \gamma_{21i}\text{pm612} + \gamma_{22i}\text{pf612} + \gamma_{23i}\text{pm1319} + \gamma_{24i}\text{pf1319} + \gamma_{25i}\text{pm2059} + \gamma_{26i}\text{pf2059} + \gamma_{27i}\text{pm60p} \\ + \gamma_{28i}\text{pf60p} + \gamma_{0i}\text{durban} + \gamma_{0i}\text{region} + u_{i1}$$

We use the following model for our analysis of satisfaction with education facilities:

### **Stage 2 : Heckman regression model**

$$\text{edu\_s} = \alpha + \beta_{i1}\text{pc1\_participation} + \beta_{i2}\text{pc1\_facilities} + \beta_{i3}\text{pc1\_teacher} + \beta_{i4}\text{pc1\_BOS} + \beta_{i5}\text{pc1\_stud\_performance} \\ + \beta_{i6}\text{pc1\_stud\_coverage} + \beta_{i7}\text{responsiveness} + \beta_{i8}\text{e\_complaint} + \beta_{i9}\text{e\_bribe} + \beta_{i10}\text{e\_corrupt} \\ + \text{Durban} + \text{region} + \xi_2,$$

### **Stage 1 : Selection model**

$$\text{pub\_school\_info} = \gamma_0 + \gamma_{i1}\text{feml} + \gamma_{i2}\text{age} + \gamma_{i3}\text{edu\_pr} + \gamma_{i4}\text{edu\_jh} + \gamma_{i5}\text{edu\_hs} + \gamma_{i6}\text{edu\_higher} \\ + \gamma_{i7}\text{dcath} + \gamma_{i8}\text{dchrist} + \gamma_{i9}\text{dorel} + \gamma_{i10}\text{born\_vlg} + \gamma_{i11}\text{live\_vlg} + \gamma_{i12}\text{IPCE\_mo} + \gamma_{i13}\text{employed} \\ + \gamma_{i14}\text{hhszize} + \gamma_{i15}\text{pc05} + \gamma_{i16}\text{pm612} + \gamma_{i17}\text{pf612} + \gamma_{i18}\text{pm1319} + \gamma_{i19}\text{pf1319} + \gamma_{i20}\text{pm2059} + \gamma_{i21}\text{pf2059} \\ + \gamma_{i22}\text{pm60p} + \gamma_{i23}\text{pf60p} + \gamma_{i24}\text{hhmemcs} + \gamma_{i25}\text{hhmemvh} + \gamma_{i26}\text{hhmemcrep} + \gamma_{i27}\text{hhmemcfg} \\ + \gamma_{i28}\text{hhmemcs} + \gamma_{i29}\text{elite} + \gamma_{i30}\text{pc1\_info} + \gamma_{i31}\text{durban} + \gamma_{i31}\text{pc1\_source} + \text{Durban} + \text{region} + \xi_1$$

The indices used in Heckman correction model for health and education are constructed by using Principal Component Analysis (PCA). Following are the group of variables used in the PCA for each index.

## **Health**

### Index representing coverage (pc1\_coverage)

Area\_served= Total area covered by the puskesmas.

pop\_served = Total population served by the puskesmas.

HH\_served= Number of household served by the puskesmas.

Nkelu\_served= Number of kelurahan served.

Index representing support (pc1\_support)

ppus\_support= Number of puskesmas support per thousand population served.

pmat\_houses= Number of village maternity houses (polindes)/'000 population served.

med\_post= Number of medicine post per thousand population served.

Index representing service (pc1\_service)

sdoc=Proportion of doctors in total medical staffs in the puskesmas.

snurse=Proportion of nurse in total medical staffs in the puskesmas.

sden= Proportion of dentists in total medical staffs in the puskesmas.

doc\_avhrs= Average hours of services by doctors as a proportion to medst\_avhrs.

den\_avhrs= Average hours of services by dentists as a proportion to medst\_avhrs.

nurse\_avhrs= Average hours of services by doctors as a proportion to medst\_avhrs.

medst\_dprac=1 if any medical staff has outside private practice.

Doc\_pns= Number of doctors with PNS type employment.

dsvaccine\_nw = Dummy variable to represent number of weeks the puskesmas ran out of stock of vaccine.

dsmed\_nw = Dummy variable to represent number of weeks the puskesmas ran out of stock of vaccine

h\_serv\_loc = Location of health service provided

Index representing infrastructure (pc1\_infra)

pbath= Number of bathrooms in the puskesmas per thousand population served.

pgen= Number of generators in the puskesmas per thousand population served.

pcomp= Number of computers in the puskesmas per thousand population served.

pptbed= Number of beds for public treatment in the puskesmas per thousand population served.

pbrthbed= Number of delivery beds in the puskesmas per thousand population served.

pinpatient= Number of patient used inpatient facilities in the puskesmas per thousand population served.

pbeddays= Number of beds days generated in the puskesmas per thousand population served.

Index representing participation (pc1\_participation)

Ideas\_health =whether the household shared ideas in meetings for health programs.

present\_health =whether the household was present in meetings for health programs.

contribute\_health =whether the household contributed money for health programs.

Index representing availability of information (pc1\_info)

awareness\_health=Whether the household knows about any health program for improvement of health services.

infokelu\_budget = whether the household has information about kelurahan budget

infokelu\_devplan = whether the household has information about kelurahan development plan.

infokelu\_compdelivered= whether the household has information about complaint delivered against the health services

h\_corrupt = whether the household has information about corruption in health service

h\_bribe = whether the household has information about bribery in health service.

Index representing sources of information (pc1\_source)

infosource\_radio = source of information: radio

infosource\_TV = source of information: TV

infosource\_newspaper= source of information: News paper

aware\_district ==source of information: Lurah/village head, subdistrict head etc.

**Education**

Index for participatory mode of management (Pc1\_participation)

dec\_printcher= Decision about school's mission and vision was made together by principal and the teachers

dec\_prtrchcom= Decision about school's mission and vision was made together by principal, teachers and community.

Index for village level information (Pc1\_info)

infokelu\_budget =HH has information on kelurahan budget

infokelu\_devplan= HH has information on kelurahan Dev. Plan

infokelu\_BPD= HH has information on kelurahan BPD

infokelu\_compdelivered= HH has information on any complaint delivered to Kelurahan.

Index for sources of such information (PC1\_source)

infosource\_radio =Sources of information: radio

infosource\_TV= Sorces of information: TV

infosource\_newspaper= Sources of information: News paper

Index for teacher quality (Pc1\_teacher)

Nteacher= Number of teachers

aterm\_tchr= Average term of a teacher

atch\_hrs= Average teaching hours

teach\_stud\_ratio= Teacher to student ratio

ateach\_experience= Average years of experience of a teacher

Index for school facilities (Pc1\_facilities)

pgood\_throom= Proportion of good theory rooms to total theory rooms

pgood\_comproom= Proportion of good computer rooms to total computer rooms

pgood\_libroom= Proportion of good library rooms to total library rooms

pgood\_sportshall =Proportion of good sports hall to total sports hall

light\_facility= Wheter the school has proper electricity

books\_student= Books available per student

totclassrm= Total number of class rooms

Index for student performance (Pc1\_stud\_quality)

Tmaledrop= Total male dropouts

Tfemdrop= Total female dropouts

Totmalerepeat= Total male repeats

Totfemerepeat= Total female repeats

Index for coverage (Pc1\_stud\_coverage)

nrgd\_stud= Number of registered students

nattd\_stud= Number of attending students

Index for BOS coverage (Pc1\_bos\_coverage)

impl\_MBS= Whether school based management is implemented

prepared\_RIPS= Prepared school development plan together

prepared\_RAPBS= Prepared school budget together

receive\_BOSinfo= Received adequate information on BOS

adq\_BOSsocial =Whether socialization on BOS was adequate

nBOS\_disbursed =Number of BOS disbursement

adq\_BOS= Whether BOS amount was adequate

npstudent\_BOS= Number of poor students covered under BOS