The effect of a poverty reduction policy and service quality standards on commune-level primary health care utilization in Thai Nguyen Province, Vietnam

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Although universal access to quality health services is a primary policy goal of the Government of Vietnam (GOVN), economic restructuring and privatization of health services have been associated with emerging inequities in access to care. A GOVN programme for socio-economic development known as Program 135 (P135) designates communes known to be relatively poor as priority localities for development resources. Under this programme, basic curative and preventive health services, including some prescription drugs, are provided free of charge at commune health centres (CHCs). In an effort to improve the quality of care provided at CHCs, the national Ministry of Health (MOH) has implemented a set of national benchmarks for commune health care, which defines a minimum configuration of equipment, staff, training and other elements of service provision.

This research examines the impact of P135 poverty reduction policy, achievement of MOH benchmark indicators and commune socio-economic characteristics on CHC utilization rates in Thai Nguyen Province, Vietnam.

The analysis uses administrative data reported from 178 CHCs in Thai Nguyen Province for nine quarters, including 2004, 2005 and the first quarter of 2006. Mixed linear regression models are used to estimate the main and interaction effects on utilization rates of exposure to the P135 policies, achievement of MOH benchmarks, poverty, distance to the district hospital and ethnic composition.

Communes that are poor and remote have comparatively high CHC utilization rates. Multivariate regression results suggest that communes exposed to the P135 policy have higher utilization rates, but these effects are conditional upon achievement of benchmark standards, thus perceived quality care enhances CHC utilization. Combining Program P135 with benchmark investment reduced the gap between primary health care utilization in poor communes versus those that are less poor. These commune-level findings suggest that CHC policies differentially benefit poor communities and reduce inequality in use of health care services.

Keywords Quality of care, poverty, health service utilization, benchmark, Program 135, Vietnam
KEY MESSAGES

- Program 135 promotes utilization of commune health centres through the provision of free services, particularly in relatively poor communes in Thai Nguyen Province.
- The effect of free services is conditional on developing services to benchmark standards of quality care. Perceived quality of care is therefore an essential prerequisite for service utilization.
- Combining free services with benchmark investment reduced the gap between primary health care utilization in poor communes versus those that are less poor. CHC policies thereby differentially benefit the relatively poor and reduce inequity in health care services.

Introduction

Three decades ago, the Alma Ata Global Health Conference established the goal of increasing access to quality primary health services in all low-income and transitional countries. Achieving an understanding of factors affecting the use of primary health services remains critical to evidence-based health planning. Throughout the post-Alma Ata era, the Government of the Socialist Republic of Vietnam (GOVN) has been at the forefront of international commitment to providing preventive and curative health care for all. Yet primary care at the commune level of the public health system in Vietnam may fall short of national goals to provide quality public services that meet user expectations. This concern is particularly relevant to segments of the population that are poor, remote or ethnic minorities and dependent on care provided by the public sector (Toan et al. 2002; Wagstaff 2007; Dao et al. 2008; Teerawichitchainan and Phillips 2008).

As health system changes have increased the options available for health services, perceived quality may be important in determining utilization, even in poor communes. We explore the impact of a programme providing free services at commune level, as well as commune socio-economic characteristics and achievement of quality standards, on utilization rates of public primary health care.

Health sector reforms and poverty-reduction policy in Vietnam

The shift to a market economy in Vietnam in the late 1980s (known as doi moi) was accompanied by health sector reforms that included the imposition of user fees for curative services at commune health centres (CHCs), at district health centres and at provincial and national hospitals; the legalization of some types of private medical practice; and liberalization of the pharmaceutical industry (Guldner 1995; Witter 1996). A national system of health insurance was introduced in August 1992 as a mechanism for financial risk protection and a source of funds for public health services (Ensor and San 1996; Ekman et al. 2008). This system included a mandatory scheme for salaried employees and a voluntary scheme on care workers in the informal sector, but rates of enrolment among the poor were low (Jowett et al. 2003; Jowett et al. 2004; Sepehri et al. 2006). In 1994, a user fee policy exempted the extreme poor from the payment of examination fees and provided some drugs free of charge. The poor were identified by poverty assessments conducted by the Ministry of Labour, War Invalids and Social Affairs (MOLISA) and the People’s Committees, and this programme covered approximately 30% of poor individuals. Still, inequality in service utilization increased between national surveys conducted in 1992–93 and 1997–98 (Dao et al. 2008).

GOVN’s Program for Socio-Economic Development in Communes Facing Extreme Hardship in Ethnic Minority and Mountainous Areas (often referred to as Program 135, hereafter P135) was introduced throughout Vietnam in 1998. P135 provided support and services, not limited to health, to especially disadvantaged communes in the province of Thai Nguyen, and six other mountainous provinces. The programme funded construction of infrastructure such as roads, health centres, schools, irrigation and water supply systems, as well as education, training and economic development projects. It also enabled all residents of communes identified as disadvantaged to access health care free of charge. In 1999, this programme was extended to poor households residing in non-P135 communes by a nationwide programme that called on provinces to issue health insurance cards to 4 million poor Vietnamese. This policy had limited impact. It was funded at province level, with no additional subsidies from the central government, and so the programme was not sustainable in poorer provinces (Nguyen 2004). In response to this, in 2002, GOVN’s Decision 139 (P139) established a health insurance scheme in each province called the ‘Health Care Fund for the Poor’, with substantial support from the central government (Wagstaff 2007). This extended the benefits of P135 to poor families residing in communes not exposed to P135, as well as to ethnic minority residents in 10 mountainous provinces in the northern and central highlands. A parallel programme was launched in 2004 that provides free health care for all children under the age of 6, irrespective of their household economic status, but this has not yet been evaluated (Ekman et al. 2008).

These policies have been instituted in the context of a national movement to decentralize planning and resource allocation, by enhancing the provincial health service authority to plan strategies that improve primary health care access, quality and efficiency (Fritzen 2007). To the extent that decentralization focuses resources on commune-level care, these investments may also contribute to poverty reduction policies.

The effect of health sector reforms on service utilization

Evidence suggests that reform over the past two decades has had profound effects on patterns of service utilization, as a burgeoning private health care sector and a rapidly expanding pharmaceutical production and retail industry increase choices available to those seeking care (Ha et al. 2002;
Sepehri et al. 2003). Though health service seekers now have alternative sources of private care to consider along with public options, and reliance on self-treatment is widespread (Okumura et al. 2002), there is little regulation to protect patients using private medical providers and drug vendors (Sepehri et al. 2003).

Health care costs for low- and middle-income households are now substantial and may limit access to quality care (Sepehri et al. 2003). Research has demonstrated that health insurance programmes have been successful in reducing barriers, though their impact has been limited by low rates of enrolment among the poor. A survey in three provinces found that programmes such as voluntary health insurance have increased use of public providers and outpatient facilities, and decreased reliance on self-treatment and private providers (Jowett et al. 2003; Jowett et al. 2004). Health insurance was also found to reduce out-of-pocket expenditure, with more pronounced reductions for individuals with low incomes (Sepehri et al. 2006). Overall, national survey data suggest that more widespread uptake of insurance and poverty alleviation policies have contributed to a less regressive system over the period 1992–2002 (Chaudhuri and Roy 2008). A recent paper by Sephiri et al. (2008b) evaluated the effect of health insurance for the poor in 2001–02, along with compulsory and voluntary insurance schemes, and found that it increased access by 44% compared with those without any health insurance.

Less is known about the effect on service utilization of the more recent P135, which, unlike earlier insurance schemes, was implemented at the commune rather than individual level. Research is needed to understand how P135 interacts with other commune characteristics, such as rates of poverty, and importantly, quality of available care, to influence service utilization.

Public delivery of primary health services in Vietnam

The primary access point for public services in Vietnam is the commune health centre (CHC). Each CHC is staffed by a physician and three or four other health professionals (assistant doctors, pharmacists and/or nurses), and is mandated to provide basic curative and preventive health services for a population of 5000–7000 people. CHCs are charged with implementing national health programmes, providing examination and treatment for common diseases, health counselling, referral services for patients with serious illnesses, prenatal and postnatal care, and common delivery services. CHCs also receive short-term inpatients when necessary (for example, for transmitting intravenous fluids). For patients covered by GOVN health insurance schemes, CHCs are also the referral point for higher-level care.

Despite the critical role of CHCs in providing services for the poor, existing research has been limited in its ability to explore commune-level determinants of utilization, such as quality of service delivery. This is likely because existing research has largely relied on national survey data or smaller scale surveys of individuals, which lack rich data on commune characteristics. In a study of individual, household and commune characteristics and maternal health service use, Sephiri et al. (2008a) found that a high commune poverty rate and longer distance to the nearest hospital were both associated with significantly lower odds of using antenatal care and giving birth in a facility, as were unobserved commune-level characteristics. This suggests the need to look at additional commune characteristics beyond socio-economic composition and geographical location, such as commune-level anti-poverty programmes and characteristics of service delivery.

One example of a programme affecting commune-level service delivery is the implementation by the Ministry of Health (MOH) of national benchmarks for CHCs (Ministry of Health 2005). This represents an effort to monitor and improve the quality of services at CHCs, through the assessment and review of benchmark standards, though no additional resources are provided to assist in the upgrading of communes. There are 10 sets of key requirements for the achievement of benchmark standards issued by the central MOH, each represented by a set of indicators that are monitored in annual updates: (1) social mobilization of communities for the provision of health care outreach, including preventive health services and health education; (2) indicators of the status of sanitation work; (3) indicators of readiness for rehabilitation, diagnostic and treatment services; (4) the provision of traditional medical care at the commune level; (5) readiness to deliver preventive childhood health services, such as immunization; (6) readiness to provide reproductive health care; (7) the availability of basic equipment and facilities for primary health care; (8) the availability of essential human resources; (9) compliance with planning and financial standards; and (10) the availability of essential medicines and the appropriate provision of essential drugs. The MOH provides the standards and tools for assessment, and supports the provincial health services in assessing quality at all CHCs. Tools include detailed checklists, which yield quantitative scores as the outcome and are then dichotomized based on thresholds of benchmark achievement.

These benchmark standards provide a method to measure commune-level quality of care, using routinely collected data. Though no formal assessment of validity or reliability is available, the selected benchmarks reflect all elements of CHC services, and have strong face-validity. As these have been implemented throughout Vietnam, they also enhance the generalizability of these findings to other provinces.

Objectives

Even in poor and remote areas, patients have choices for health care outside the public system. If perceived quality of CHC care is low, patients may choose self-treatment, or to seek care elsewhere, even if CHC services are subsidized. We therefore seek to explore the interaction between programmes that lower the barrier of cost, and that seek to improve quality or public primary health services.

This paper examines two GOVN programmes: one aimed at poverty reduction, which includes provision of free public health services (P135); the other addresses quality of care at CHCs, the frontline of the public health system (benchmark standards). We use archival health services data obtained directly from CHCs to: (1) describe the context of CHC service provision in Thai Nguyen Province; (2) examine the impact of commune socio-economic characteristics and free services under P135 on CHC service utilization; and (3) examine the combined effects of free services under P135 and achievement
of health service benchmark standards, as a measure of perceived quality of care, on CHC service utilization.

Data and methods
Data collection
The study site was Thai Nguyen Province, a mountainous province 80 km north of Hanoi. With a population of 1.32 million on the 1999 census, ethnic minorities make up 19% of the population. Thai Nguyen is geographically heterogeneous, with urban as well as very remote areas. Though the poverty rate has fallen in the past decade (as in the rest of Vietnam), highly impoverished areas remain. In the poorest district of Vo Nhai, 52% of the population is still below the national poverty line. Thai Nguyen has participated in P135 since 1998.

Thai Nguyen provides a unique opportunity to study issues of health services accessibility, as there is excellent data availability, and the provincial health authority is highly supportive of evidence-based investigation to improve health policy. Of 180 communes in the nine districts of Thai Nguyen Province, all but two had computerized records at commune level. Archival health information system (HIS) data describing curative and preventive health services utilization were available for the nine quarters, including 2004, 2005 and the first quarter of 2006. Additional administrative data describing equipment and staff availability, staff training participation and facility development, based on MOH benchmark standards, were collected directly from each CHC, computerized and linked to the HMIS database.

Data describing commune socio-economic characteristics were obtained from several additional sources. Commune population, ethnicity and number of children under 5 years old were obtained from Vietnam’s 1999 Population and Housing Census. The percentage of poor households was provided by the Provincial Department of Labour, Invalids and Social Welfare. Data on exposure to P135 were collected from the Provincial Department of Health Insurance.

Outcomes and predictors
The outcome variable for this analysis was the number of preventive and curative visits to each CHC, divided by the commune population, calculated for each quarter. Utilization rates are presented as visits per 1000 commune residents per quarter.

The independent variables of interest are commune exposure to P135 and CHC achievement of MOH benchmark standards, as well as distance to the district hospital, percentage of minority population and percentage of the population who are poor.

P135 was first implemented in 18 communes in Thai Nguyen in 1998, expanding to another 18 communes in 2002 and 16 communes in 2006. Exposure to P135 is scored as ‘one’ if a commune was designated P135 eligible, and ‘zero’ otherwise. Once a commune was designated, it is considered ‘exposed’ in all subsequent quarterly observations.

Benchmark attainment is comprised of a complex set of 10 benchmarks, each characterizing some aspect of readiness to provide primary health care at the CHC level. In the first model, we use a subset of benchmarks that measure staff, training, equipment and facility readiness. These were selected because they are of particular interest for resource allocation and priority-setting, as they relate to direct investment in CHCs. No single one of these indicators independently measures quality of service. Rather, the first model seeks simply to explore whether any of these selected indicators are independently related to service use, in order to identify priority areas for investment.

In a second model focusing on interactions, a dummy variable was defined to summarize the status of each CHC on all 10 benchmarks. A CHC that has achieved all 10 minimal benchmark standards is classified as a CHC that has passed the benchmark review (1); failure to achieve any of the 10 defined benchmark standards is termed a failure to achieve benchmarks (0). Benchmark achievement was scored annually.

Distance to the nearest referral point is the distance from the commune to the closest district hospital. Poverty is assessed by MOLISA using a combination of three techniques: a self-assessment, an assessment by neighbourhoods and then ranking by the authorities. In rural areas where many people farm, income alone is not a good indicator of poverty, and other factors such as house size or housing density, and ownership of land or other material goods (television, bicycle, motorcyce) are also included in assessments. The percentage of commune residents was available from MOLISA for the first year of the study, and was used as a fixed variable over time.

Statistical analysis
Analyses test the hypothesis that exposure to P135 and achievement of benchmarks are associated with CHC utilization. Regression analysis tests the hypothesis that main effects of policies are significant, while interactions test the hypothesis that policies are synergistically more effective when implemented jointly rather than independently. Models also examine the proposition that policies directed at improving CHC services also constitute poverty interventions. This is operationalized by testing the interaction of policy variables with the percentage of commune populations below the poverty level. If CHC development policies are more responsive to the health care needs of poor communes, regression parameters for interactions will demonstrate that policies have a greater impact on utilization rates in communes that are relatively poor than in communes that are less poor.

Exploratory analysis was conducted by examining standard descriptive statistics and bivariate relationships. Multivariate regression was then used to examine the adjusted role of variables and specified interactions in relation to CHC utilization. Because outcome variables were repeated measurements at nine points in time (nine quarters), observations of a given CHC tended to be more similar than separate observations of different CHCs. Mixed models were used to account for these repeated measures.

Results
Context of CHC service provision in Thai Nguyen Province
Poverty levels in the study communes ranged between 1.4 and 82.4% of the population (data not shown). Ethnic minorities
Thai Nguyen CHCs to the nearest
or rooms at the Department of Population and Family Planning.

providing primary health care services (92%). The remainder
in 2004 and 51 (28.3%) achieved national benchmarks in 2005.

exposed in 1998, 11.5% in 2002 and 10.2% in 2006. Of the 178
classified as P135 communes at some point in time, with 11.5%
communes (Table 1). A third of the study communes were
comprised more than half of the population in 30.5% of
communes (Table 1). A third of the study communes were
classified as P135 communes at some point in time, with 11.5%
exposed in 1998, 11.5% in 2002 and 10.2% in 2006. Of the 178
study communes, 22 (12.2%) achieved the national benchmarks
in 2004 and 51 (28.3%) achieved national benchmarks in 2005.

Most CHCs were equipped with a separate building for
providing primary health care services (92%). The remainder
provided services in temporary locations, such as rooms of a
kindergarten or secondary school, a district committee building
or rooms at the Department of Population and Family Planning.
The average distance from Thai Nguyen CHCs to the nearest
district health centre is 11.4km, with distances ranging
between 1 and 60 km. The presence of a physician was reported
in most of the quarterly observations (86.9%). Only 11.9% of
CHCs had two physicians reported and 1.2% lacked an assigned
medical officer.

Thai Nguyen CHC utilization rates varied markedly from
quarter to quarter (Figure 1). On average, there were 207.9
visits per 1000 commune residents in each quarterly period,
ranging from a peak of 275.6 in the second quarter of 2004 to a
minimum of 162.3 in the third quarter of 2004. Thus on
average CHCs provide 4900 visits per year, or approximately 20
visits per usual work day, though the number of residents
varies by CHC. Although seasonality is suggested by the
relatively high second-quarter CHC utilization rate, there is no
evidence of a systematic time trend in the utilization of CHC
services (Figure 1, left panel). Analysis therefore focuses on
determinants of the level of CHC utilization rates rather than
of time trends. CHCs that achieved benchmarks had signifi-
cantly higher utilization rates than those that had not
(233.8±140.9 vs. 200.3±140.0, P = 0.0002). This relationship
prevailed for all quarters except the first in 2004 (Figure 1, right panel).

Association of CHC utilization rates with P135
exposure and poverty level

The quarterly visitation rate in the poorest quartile of
communes was 339 per thousand commune residents, versus
179 in the most prosperous communes. This translates into
utilization rates that are 89.4% higher in poor communes than
in non-poor communes. As Figure 2 shows, utilization rates for
the two most prosperous quartiles are equivalently low, with
utilization accelerating as poverty levels increase.

In Thai Nguyen Province, 52 communes are designated as
P135 while 128 are not. CHC utilization rates are directly
associated with P135 exposure (Figure 3); the longer the
exposure to P135, the higher the CHC utilization rate. On
average, commune exposure to P135 is associated with almost
100 additional CHC visits per 1000 commune residents, relative
to unexposed communes. This provides an indication that free
services accelerate demand for care at these facilities.

Multivariate analysis

Table 2 reports regression results for two models. Model 1
estimates P135 main effects and interactions with commune
poverty level with a sub-set of benchmark indicators. Model 2
repeats the specification of P135 and poverty level, but specifies
benchmark achievement as a dichotomous variable, and adds
interaction effects for exposure of communes to combinations
of poverty-reduction policies and benchmark achievement.

Multivariate analyses suggest that key associations evident in
bivariate tabulations are robust to the introduction of statistical
controls. However, additional insights emerge from the multi-
variate results. Model 1 shows that exposure to P135 in 1998
and 2002 had contrasting main effects. Communes initially
selected for P135 were Vietnam’s poorest, most remote
localities; communes added to the programme in 2002 were
less poor. The significant interaction of exposure to P135 in
1998 with poverty level suggests that service utilization rates,
while generally low in initial P135 communes, increase with

Table 1 Characteristics of CHCs in Thai Nguyen Province

<table>
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<th>Continuous variables</th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quarterly reported clinical cases (dependent variable)</td>
<td>1158.7</td>
<td>889.0</td>
<td>0–8130</td>
</tr>
<tr>
<td>Commune population</td>
<td>5909.3</td>
<td>2767.0</td>
<td>2028–19297</td>
</tr>
<tr>
<td>Age of CHC</td>
<td>9.0</td>
<td>6.4</td>
<td>1.7–35.7</td>
</tr>
<tr>
<td>Distance to nearest referral point</td>
<td>11.4</td>
<td>9.3</td>
<td>1–60</td>
</tr>
<tr>
<td>Number of quarterly referral point observations</td>
<td>5.0</td>
<td>2.6</td>
<td>1–9</td>
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</table>

<table>
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<tr>
<th>Categorical variables</th>
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</thead>
<tbody>
<tr>
<td>Communes</td>
<td></td>
</tr>
<tr>
<td>Percentage minority (n = 164)</td>
<td></td>
</tr>
<tr>
<td>0–24.9%</td>
<td>81</td>
</tr>
<tr>
<td>25–49.99%</td>
<td>33</td>
</tr>
<tr>
<td>50–74.99%</td>
<td>30</td>
</tr>
<tr>
<td>≥75%</td>
<td>20</td>
</tr>
<tr>
<td>Percentage of households that are poor (n = 176)</td>
<td></td>
</tr>
<tr>
<td>0–19.99%</td>
<td>55</td>
</tr>
<tr>
<td>20–39.99%</td>
<td>65</td>
</tr>
<tr>
<td>40–59.99%</td>
<td>45</td>
</tr>
<tr>
<td>≥60%</td>
<td>11</td>
</tr>
<tr>
<td>Quarterly CHC observations</td>
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</tr>
<tr>
<td>Exposure to P135 (n = 1415)</td>
<td></td>
</tr>
<tr>
<td>Never exposed</td>
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</tr>
<tr>
<td>Exposed in 1998</td>
<td>162</td>
</tr>
<tr>
<td>Exposed in 2002</td>
<td>162</td>
</tr>
<tr>
<td>Exposed in 2006</td>
<td>144</td>
</tr>
<tr>
<td>Benchmarks achieved (n = 1603)</td>
<td></td>
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<tr>
<td>No</td>
<td>1143</td>
</tr>
<tr>
<td>Yes</td>
<td>460</td>
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<tr>
<td>Equipped with a separate facility (n = 1460)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>117</td>
</tr>
<tr>
<td>Yes</td>
<td>1343</td>
</tr>
<tr>
<td>Number of physicians (n = 1391)</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td>1</td>
<td>1209</td>
</tr>
<tr>
<td>2</td>
<td>165</td>
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poverty level. Significant main effects and non-significant interactions with poverty for P135 exposure in 2002 suggest that P135 contributed to increased utilization in these communes, regardless of poverty level.

Proximity to the district hospital has no relationship with total utilization rates, despite evidence from bivariate analysis that utilization increases with CHC distance to the district hospital (not shown). This change in estimated effect from significance to multivariate insignificance is likely due to the fact that distance is correlated with other variables included in the multivariate model, such as percentage poverty and minority residents.

Significant main effects of selected indicators of benchmark inputs, estimated in conjunction with P135 and poverty, lend support to the hypothesis that infrastructure investment contributes to demand for services over and above the effect of P135. The utilization rate was unaffected by the total number of staff, but an association was observed for the addition of a second doctor to CHC staff. There is no association between the utilization rate and levels of staff training. However, indices of equipment completeness and facility readiness are associated with CHC visitation rates. While findings suggest that not all CHC investments can be assumed to affect demand for CHC services, commitments to equipment and facility development and medical staffing appear to be associated with demand for CHC services.

Model 2 shows that the P135 effect is conditional upon the duration of commune exposure to this programme. The main effects of long-term exposure to P135 are negative (coefficient = −160.7), while short-term effects appear to be strongly positive (coefficient = 424.8), and non-exposure to P135 is midway between the association estimated for long-term and short-term P135 exposure (intercept = 166.9). Moreover, these relationships are conditional upon benchmark achievement, as demonstrated by the pronounced and significant interaction terms. The negative 1998 P135 main effect is completely offset by achievement of benchmarks (coefficient = 657.2).

**Discussion and policy implications**

Regression findings suggest that the interplay of commune poverty level, availability of free services and service quality is complex, as commune poverty shapes the climate of demand. While poverty is significant in bivariate analysis, the inclusion...
of P135 and net benchmark main effects as multivariate discrete indicators reduces net poverty and minority status associations to insignificance. As the goal of P135 was to provide targeted support and services to especially disadvantaged communes and ethnic minorities, this appears to have been achieved, at least in the case of utilization of primary health services. However, interactions of benchmark achievement and P135 with poverty show that demand for CHC services is related to the interaction of free services with the level of poverty. Furthermore, this interplay is conditional upon the general climate of service quality as represented by the benchmark–poverty interaction variable. While P135 contributes to demand for services, this effect is conditional on developing services to benchmark standards.

Examination of interactions uncovers effects of policy importance that are masked by simple bivariate results. This is illustrated in Figure 4 which displays contrasting results from the first multivariate regression model of the association of poverty with utilization for P135 exposed and P135 unexposed communes, where benchmarks are not achieved and are achieved. Simulated effects are net of multivariate controls for distance to service referral point, quarterly observation time and percentage minority composition of commune populations.

As expected, Figure 4 shows that CHCs that have achieved benchmarks have higher areas under the regression lines than the CHCs that have not achieved benchmarks and are unexposed to P135. Where P135 is in effect and benchmarks are not, the volume of care is directly related to poverty level: the poorer the commune, the higher the dependence on CHC services, since health care is free. This is consistent with the hypothesis that free services contribute little to demand for CHC care where poverty levels are low and service quality is poor. In such situations, the population seeks health care elsewhere. Where benchmarks are achieved, utilization rates are elevated irrespective of P135 exposure or poverty level. When service standards are met, residents of the poor and the less poor communes are equally inclined to utilize CHC services. While results are based on aggregate rather than individual data, relationships in Figure 4 are consistent with the conclusion that investment in benchmarks enhances demand for CHC services among the poor and the less poor, producing a clientele that is more equally distributed by economic strata than if CHC service readiness capability is below standard.

These findings reflect observations from qualitative research we conducted, that patients with sufficient income, along with

| Table 2 | Fixed effects regression analysis of the association of exposure to P135, poverty level, ethnic composition, distance to referral point and indicators of benchmark status on total visitation rates, Thai Nguyen Province, January 2004–March 2006 |
|---|---|---|
| Independent variables | Benchmark indicators and P135 main effects (Model 1) | Benchmark achievement with P135 interactions (Model 2) |
| | $\beta$ | SE | $\beta$ | SE |
| Intercept | 48.6 | 26.0 | 166.9 | 12.2** |
| Ordinal time in 90-day observation periods | $-2.4$ | 1.7 | $-1.9$ | 1.6 |
| Exposure to P135 in 1998 | $-153.2$ | 82.0 | $-160.7$ | 79.9* |
| Exposure to P135 in 2002 | 139.5 | 65.0* | 424.8 | 114.3** |
| Percentage of population in poverty | $-1.7$ | 0.4** | 0.7 | 0.4 |
| Percentage of minority population | 0.6 | 0.2* | 0.1 | 0.2 |
| Distance to nearest referral point | 1.4 | 0.7 | 0.9 | 0.6 |
| Benchmark achieved$^a$ | – | – | 46.3 | 9.7** |
| Interaction effects: | | | | |
| P135 in 1998*poverty | 5.1 | 1.4** | 5.0 | 1.4** |
| P135 in 2002*poverty | $-2.0$ | 1.5 | $-7.7$ | 2.7** |
| P135 in 1998*benchmark$^a$ | – | – | 657.2 | 236.0** |
| P135 in 2002*benchmark$^a$ | – | – | $-4.0$ | 197.4 |
| P135 in 1998*benchmark$^a$ *poverty | – | – | $-11.8$ | 3.9** |
| P135 in 2002 or 2006*benchmark$^a$ *poverty | – | – | $-0.8$ | 4.7 |
| Selected indicators of benchmark input: | | | | |
| Adding an additional physician | 40.8 | 13.3** | |
| Adding other staff | 6.7 | 4.6 | |
| Training input score | $-2.0$ | 1.5 | |
| Equipment readiness score | 4.9 | 2.0* | |
| Facility readiness score | 11.4 | 1.8** | |
| Summary statistics | | | | |
| R square | 0.16 | 0.19 | |
| Number of 90-day observations with complete data | 1031 | 1211 | |

$^a$Achieved benchmark = 1, zero otherwise.

$^P < 0.05; ^{**}P < 0.01.$
people who have convenient access to a polyclinic, district hospital or provincial hospital, often prefer these facilities to a CHC, particularly if they perceive their illness to be serious or difficult to diagnose. Some even skip the district health facility and go directly to a public or private provincial health facility. This reflects the importance of perceived quality of care as an influence on the decisions that people make when they fall ill.

This finding that service quality represents an important determinant of service utilization, even among the poor, is also reflected in other quantitative and qualitative research (Duong et al. 2004). Knowles et al. (2008) explored the association between a CHC quality index and probability of consulting a health service provider (both public and private), and found that only the poor were less likely to seek services if quality was low. This finding (based on individual likelihood rather than commune rates) suggests that while the better-off may use other services if quality of public services is perceived to be low, the poor may resort to self-treatment or may go untreated.

Figure 4 further explores the findings from Figure 4 by portraying regression effects for linear combinations of benchmark and P135 main and interaction effects from Model 2. The figure shows that benchmark achievement contributes to utilization rate, irrespective of degree of exposure of communes to P135. But the effect of long-term exposure to P135 is completely conditional upon benchmark achievement. This would be the expected result if the availability of free care, without achievement of CHC basic service standards, motivates the use of publicly funded alternatives to the CHC care, such as district hospitals or polyclinics, where free care is also available for P135 residents.

This highlights the fact that residents of poor communes still have choice regarding the source of health services. It may also reflect a key limitation of this study, as even in poor P135 communes, a majority of the population may not be officially ‘poor’, and may also be able to afford private care. It is impossible to know from these data to what extent the non-poor population uses CHC services. However, if benchmarks are achieved, and minimal standards are met, the poor and the less poor alike appear to use services more, particularly if P135 is in place and services are free to all.

This important relationship has policy implications. Findings suggest that policies addressing the financing of services alone will not address the primary health care needs of relatively poor communes. Where benchmarks are achieved, utilization rates are equivalently elevated irrespective of P135 exposure or poverty level. Once minimal service standards are met, residents of the poor and the less poor communes are equivalently inclined to use CHC services. Conversely, the implementation of programmes providing free care, but not addressing service quality, may not promote use of primary health services even among the poor.

Limitations

The use of archival health service data capturing service utilization at commune level makes an important contribution to the existing literature, but is subject to some clear limitations. Routine HMIS data from Thai Nguyen Province are marred by three types of reporting problems: (1) some CHCs fail to submit quarterly HMIS reports; (2) other CHCs omit certain data fields from their submitted reports, leading to reports of missing data, and (3) reported data sometimes have consistency errors or out-of-range values. While the HMIS data used in this report are informative, the reporting problems represent a limitation of this study. Also, utilization rates include not only curative consultation, but also a number of preventive and primary health activities. Unfortunately, we do not have data that clearly describe the proportion of curative,
prevention and health promotion services in these CHCs, as reporting is divided by national programme (malnutrition, immunization, acute respiratory infection, diarrhoea, obstetrics/gynaecology examinations, referral), and some of these cross categories of curative and preventive services.

A further limitation is that utilization rates were calculated using 1999 census data, even though the study period was from 2004 to 2006. This was the only available data, as the census is only completed every 10 years. Similarly, commune poverty percentage was only available at baseline. Along with national trends, this is expected to have decreased over time, though the relative poverty among communes likely remained constant.

Accuracy of utilization rates may also be affected by cross-border service utilization, where patients seek treatment outside of their home communes. While there may be an incentive to seek treatment at a nearby CHC with a good reputation for service quality, the difficulty of travelling too far for services and patients’ comfort in going to a known CHC likely mean that this cross-border service utilization is a minor issue.

In addition, the research design is limited by the possibility of biased results due to selection problems when looking at CHC exposure to P135 vs. non-exposure, particularly as P135 designation was based on need. For that reason, we have attempted to control for variation among CHCs by using a mixed model, with fixed effects for explanatory variables but random effects for communes. In addition, we adjusted for poverty, percentage minority and distance to CHC as confounding variables, associated with both P135 designation and utilization rates.

Further research is needed to determine if these policy initiatives are associated with improved health outcomes, not simply service usage. We also could not directly assess need for health services, but unmet needs are widespread in rural and remote Vietnam (Ekman et al. 2008). For example, a recent study examining use of health care among people with diarrhoeal illness found that the poor were at the same time more likely to suffer from diarrhoea and less likely to seek care, regardless of illness severity (Luong et al. 2007). It is therefore unlikely that increased use of services as a result of P135 financing represents a case of moral hazard, where too much health care is used as a result of policy interventions. This is supported by the fact that even in P135 communes exposed since 1998, annual per-capita usage rates remain low, with just 1.32 visits on average.

A more likely issue for equitable health services planning is that the joint effect of P135 and benchmarks reflects shifts in the service-seeking behaviour of people who can afford other services, but opt for free care at the CHC when minimal standards of care have been met. Findings from a recent study showed that policies providing free health care increased the likelihood of parents seeking professional or self-prescribed care for the better-off but not among the poor (Teerawichitchainan and Phillips 2008). Further research using individual data is required to better understand these distributional effects within P135-exposed communes. Still, it may be considered a positive sign that achieving MOH Benchmark standards enhances demand for CHC services among the poor and the less poor, producing a clientele that is more equally distributed by economic strata than if CHC service readiness capability is uniformly below standard. Also, increased use of CHC services among those who are not poor that is associated with benchmark achievement may still be a welcome outcome, as secondary and tertiary facilities are reportedly over-utilized (World Bank 2001).

Conclusion

The use of archival health service data to examine policies designed to reduce financial barriers and improve quality of care at commune level suggests that the poor are left behind when standards are low even though services are free. Although the P135 policy is more general than health services, the volume of health services appears to benefit from this development strategy, though investment in service quality, equipment and facilities is also important. Where such investments are conducted in conjunction with poverty reduction policies, their joint effect on the volume of community health services is pronounced.

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