

ANTENATAL CARE PROCEDURES AND INFORMATION REPORTED BY WOMEN IN THREE RURAL AREAS OF VIETNAM

Lieu Thi Thuy Trinh^{1, 2}, Michael John Dibley² and Julie Byles³

¹Center for Health Services and Workforce Research, Sydney West Area Health Service;

²School of Public Health, University of Sydney; ³School of Medicine and Public Health, University of Newcastle, Australia

Abstract. The objective was to identify factors related to antenatal care (ANC) procedures and information reported by women in Long An, Ben Tre, and Quang Ngai Provinces. Cross-sectional surveys were conducted. Women who had ANC during a previous pregnancy were asked if they had received any of 13 procedures and information. The Donabedian quality of health model was used to select potential related factors. Data from 857 women were available for analyses. Only 24% of the women reported ten items or more. The mean number of items reported was seven. Factors related to reporting fewer items were living in Quang Ngai (OR = 0.3, 95% CI = 0.2-0.6), having ANC at private facilities (OR = 0.4, 95% CI = 0.2-0.7), having ANC delivered by nurses or assistant doctors (OR = 0.6, 95% CI = 0.3-0.9), and unplanned pregnancy (OR = 0.5, 95% CI = 0.3-0.9). Factors related to reporting more items were being housewives (OR = 1.7, 95% CI = 1.0-2.8), consumption of iron/folate tablets (OR = 4.2, 95% CI = 2.2-8.2), more use of ANC services (OR = 2.1, 95% CI = 1.4-3.2 for sufficient utilization and OR = 3.8, 95% CI = 2.1-7.0 for sufficient plus), more perceived helpfulness of ANC (OR = 3.0, 95% CI = 1.9-4.8) and high satisfaction with ANC received (OR = 1.6, 95% CI = 1.0-2.6). The most effective interventions would be to improve the quality of health facilities and of ANC providers, and to educate women to make sufficient number of ANC visits and to seek ANC from qualified ANC providers.

INTRODUCTION

Antenatal care (ANC) is care for women during pregnancy to improve pregnancy outcomes. For ANC to be effective, along with sufficient number of visits at appropriate times, the procedures and information provided to women during ANC visits (ANC content) must meet certain standards. The World Health Organization (WHO) recommends that ANC should consist of three basic components: 1)

assessment based on medical history, physical examination and laboratory tests; 2) health promotion; and 3) care provision (WHO, 1996).

Vietnamese women are recommended to have at least three ANC visits, one during each trimester, and the ANC content provided is similar to that recommended by WHO (MoH, 2002). ANC is mostly provided by midwives, sometime by doctors and nurses, at community health centers. Costs for ANC services range from US\$ 0.5-1 (Nhan *et al*, 2000).

Worldwide, there is limited information on the ANC content provided to women and associated factors. Available information suggests that ANC content provided is far below WHO recommendations (Buekens, 1995; WHO, 2003), and more attention is given to

Correspondence: Lieu Thi Thuy Trinh, Center for Health Services and Workforce Research, Wirrabilla Building 64, Cumberland Hospital, Locked mail bag 7118, Parramatta BC, NSW 2150, Australia.
Tel: (02) 8838-2034, Fax: (02) 8838-2040
E-mail: lieu@cmed.wsahs.nsw.gov.au

bio-medical assessments than health promotion and care provision (Peoples-Sheps *et al*, 1996). Factors associated with ANC content are education, number of children, obstetric history, ANC utilization, and public/private ownership of health services (Peoples-Sheps *et al*, 1996; Kotelchuck *et al*, 1997). However, none of the studies has used a theoretical model for a systematic selection and analysis of variables.

The Donabedian theoretical framework on quality of health care is widely used in health services research (Frenk, 2000). The framework consists of three components: structures, process, and outcomes (Donabedian, 1988). Holzemer (1994) changed the term "structure" to "context" and added a vertical dimension (client, provider, and setting). Handler *et al* (2001) added the macro context, mission of the public health system, and the feedback effects of outcome on process and structure. The framework has been applied in researching structure and process of ANC services (Sikosana, 1994; Peabody *et al*, 1998; Jahn *et al*, 2000). However, no study of actual ANC content reported by women has utilized the framework. Fig 1 presents the modified framework.

The Vietnam-Australia Primary Health Care Project supported the three provinces of Long An, Ben Tre (Mekong Delta, southern region), and Quang Ngai (coastal, central region) to improve the health of women and children. In 1999, the Project conducted cross-sectional surveys to obtain information about women and children health in these provinces. Among 1,335 surveyed women, ANC adequacy levels were poor. Only 71% of the women had any ANC, and 35% had sufficient ANC utilization (defined as entering ANC within three months of pregnancy and having three or more visits). ANC content was also poor with only 17% of the women reporting 10 or more of the procedures/information out of 13 items (Trinh *et al*, 2006).

The aim of this study was to identify factors related to ANC content among women who had any ANC and had information on ANC content. The result will be useful for planning interventions to improve ANC content in the three provinces and in other similar areas of Vietnam.

DATA AND METHODS

The surveys

A multi-stage sampling method was used to select 155 communes, two hamlets within each commune, and 12 households in each hamlet. All women aged 15-49 years old in the selected household were included. Questionnaires were completed by 4,836 women (response rate = 85%). The women who had had at least one ANC visit during their previous pregnancy were included in the analyses. Individual characteristics were obtained from the respondents. Family information was obtained from the heads of households. Local health service information was obtained from health service representatives. More details of the survey can be found in Trinh *et al* (2006).

Classification of ANC content

The respondents were asked if they had received any of the 13 items of ANC content during any previous ANC visits. There were seven items on biomedical assessment, four items on care provision, and two items on health promotion (Table 1). Excluding ultrasound, all items are recommended by the Vietnamese government (MoH, 2002). ANC content was classified into fair when the women reported 10-13 items of procedures/information, and poor when the women reported 0-9 items.

Explanatory factors

Fig 1 presents the application of the modified Donabedian quality of health framework in the selection of potential factors.

Household economic status was constructed from adding values of household as-

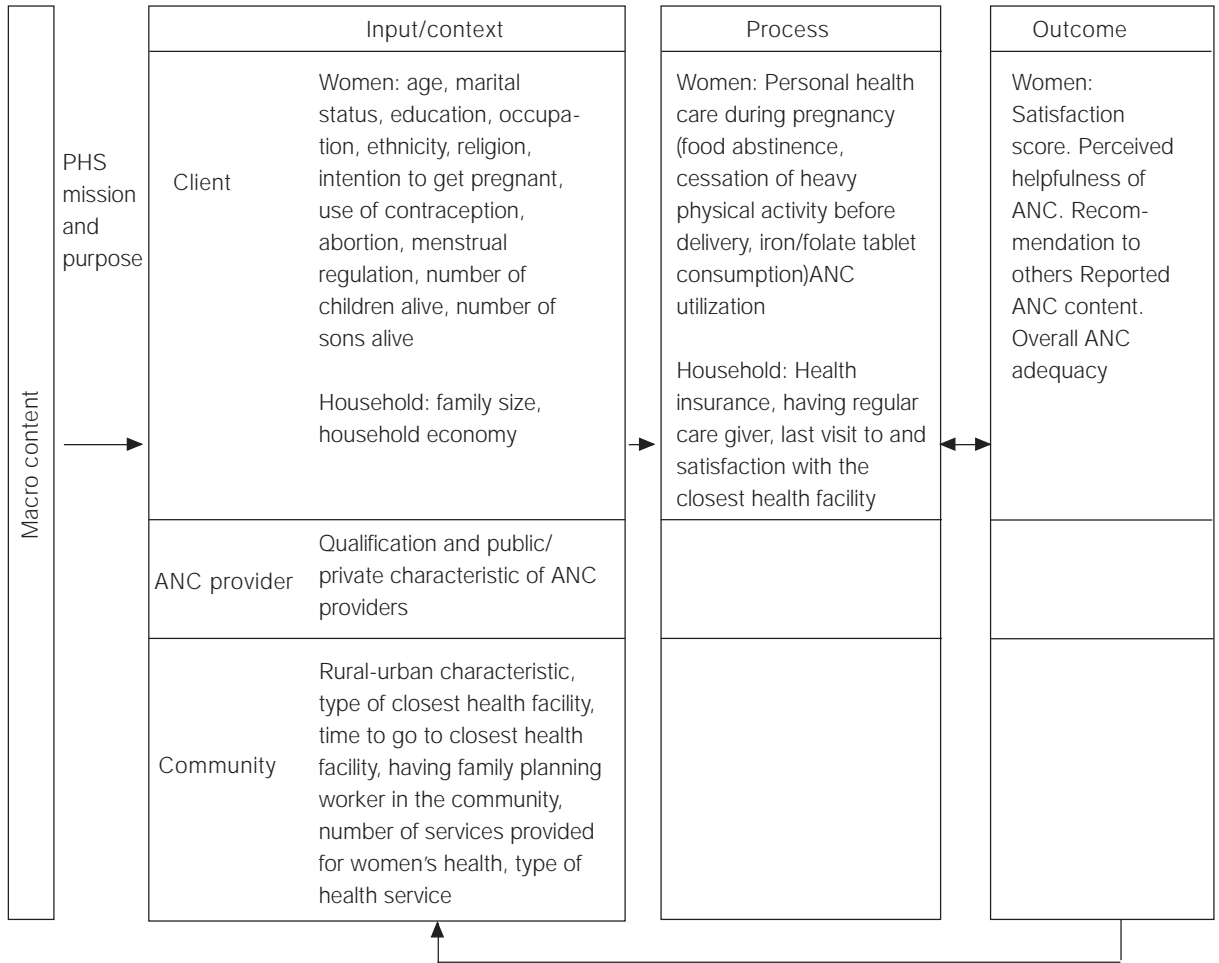


Fig 1–Theoretical framework to examine factors associated with ANC content.

sets (bicycle, cow, etc) and classified into three equal groups of “poorest”, “medium”, and “richest”. Helpfulness of ANC was measured by asking women about the benefits of ANC (eg, to know if baby was healthy) and then classified into “three or less benefits” and “four or more benefits”. Women’s satisfaction was measured by asking the women to rate the ANC services on a scale of ten. On analysis, the rated scores were very high, with 68% of women giving a score of nine or ten; therefore, the satisfaction score was categorized into “very satisfied” (9-10) and “others”. ANC utilization was classified using an index (Trinh

et al, 2006) as “insufficient” (less than three ANC visit or first visit after four month), “sufficient” (three visits and first visit within four months), and “sufficient plus” (four visits and first visit within four months).

Analysis strategies

A stepwise selection method (Cohen and Cohen, 1975) was used to build regression models. The blocks of explanatory variables (macro context, provider context, etc) were entered in the regression models one-after-another to assess the contribution of each block of variables to the final models. These

Table 1
Procedures/information reported by
women (n = 857).

| | n | % |
|-------------------------------|-----|----|
| Biomedical assessments | | |
| Measurement of blood pressure | 621 | 72 |
| Measurement of body weight | 491 | 57 |
| Measurement of fundal height | 683 | 80 |
| Monitoring fetal heart rate | 659 | 77 |
| Vaginal examination | 610 | 71 |
| Urine test | 174 | 20 |
| Ultrasound | 357 | 42 |
| Care provision | | |
| Tetanus vaccination | 628 | 73 |
| Iron/folate supplement | 197 | 23 |
| Malaria prevention | 169 | 20 |
| Safe delivery | 430 | 50 |
| Health promotion | | |
| Resting | 505 | 59 |
| Nutrition | 460 | 54 |
| Classification of ANC content | | |
| 0-9 items | 650 | 76 |
| 10-13 items | 207 | 24 |

contributions were assessed by the changes in R-squared when adding a block to the linear regression model (Cohen and Cohen, 1975).

Data was analyzed using the "survey" commands in STATA, version 8.2 (StataCorp, College Station, TX, 2004) to adjust for sampling weights, cluster sampling design, and stratification of the cluster sampling.

RESULTS

Of the 917 women who had one or more ANC visit, 60 women (7%) had missing values on one or more of the ANC content items, which left 857 women for analyses.

Characteristics of the women

Table 2 presents the characteristics of the women. The majority of the women were in their 20s (54%), married (97%), farmers (64%),

Table 2
Characteristics of the women (n = 857).

| Variable | % |
|----------------------|----|
| CLIENT | |
| Women context | |
| Age | |
| < 20 | 3 |
| 20-29 | 54 |
| 30-39 | 35 |
| 40+ | 8 |
| Marital status | |
| Married | 97 |
| Not married | 3 |
| Education | |
| No primary education | 33 |
| Primary | 39 |
| Secondary or higher | 28 |
| Occupation | |
| Farmer | 64 |
| Non-farmer | 18 |
| Housewife | 18 |
| Ethnicity | |
| Kinh | 92 |
| Others | 8 |
| Religion | |
| None | 45 |
| Buddhist | 27 |
| Christian | 23 |
| Others | 5 |
| Intended pregnancy | |
| Yes | 83 |
| No | 17 |
| Used contraception | |
| Yes | 73 |
| No | 27 |
| Had abortion | |
| Yes | 2 |
| No | 98 |
| Number of children | |
| 1 | 34 |
| 2 | 34 |
| 3+ | 32 |
| Number of sons | |
| 0 | 29 |
| 1 | 44 |
| 2+ | 27 |

Table 2
(continued).

| Variable | % |
|--|----|
| Women process | |
| Food abstinence | |
| Yes | 16 |
| No | 84 |
| Stop heavy physical activities before delivery | |
| None - < 1 month | 33 |
| 1 - < 3 months | 51 |
| > 3 months | 11 |
| Iron/folate tablet supplement | |
| Yes | 8 |
| No | 92 |
| ANC utilization | |
| Insufficient | 48 |
| Sufficient | 41 |
| Sufficient plus | 11 |
| Women outcomes | |
| Satisfaction score | |
| ≤ 8 | 32 |
| 9-10 | 68 |
| Recommendation to others | |
| Yes | 91 |
| No | 9 |
| Helpfulness of ANC received | |
| 0-3 uses | 56 |
| 4-6 uses | 44 |
| Household context | |
| Family size | |
| 1-5 | 47 |
| ≥ 6 | 54 |
| Economic status | |
| Poorest | 33 |
| Middle | 34 |
| Richest | 33 |
| Household process | |
| Health insurance | |
| Yes | 61 |
| No | 39 |
| Regular health care giver | |
| Yes | 59 |
| No | 41 |
| ANC PROVIDER | |
| Type of ANC providers | |
| Doctors, midwives | 65 |
| Assistant doctors, nurses | 29 |

Table 2
(continued).

| Variable | % |
|-----------------------------------|----|
| Type of ANC facility | |
| Public | 74 |
| Private | 26 |
| COMMUNITY | |
| Urban-rural characteristic | |
| Urban | 10 |
| Rural | 90 |
| Closest health facility | |
| Public | 85 |
| Private | 15 |
| Time to closest health facility | |
| ≤ 30 minutes | 88 |
| > 30 minutes | 12 |
| Last visit to health facility | |
| ≤ 3 months | 60 |
| > 3 months | 40 |
| Satisfaction with health facility | |
| 5-8 scores | 37 |
| 9-10 scores | 63 |
| Community family planning worker | |
| Yes | 64 |
| No | 36 |
| Women's health services available | |
| 0-3 services | 40 |
| 4-7 services | 60 |
| Type of health service | |
| Government | 61 |
| Non-government | 39 |
| MACRO CONTEXT | |
| Province | |
| Long An | 34 |
| Ben Tre | 19 |
| Quang Ngai | 46 |

Kinh ethnicity (92%), and had an average of two children. Half of the women (48%) did not have sufficient ANC utilization, and 56% reported three or less instances of "perceived helpfulness" of by ANC providers. Households had an average of five residents. Sixty-one percent of households had health insurance. A large number of ANC providers were doc-

tors or midwives (65%), and the majority of women had ANC delivered at a public health facility (74%) and lived in rural areas (90%).

Procedures/information reported by women

Table 1 presents the reported ANC content items. The most commonly reported items were measurement of fundal height (80%), blood pressure (72%), monitoring fetal heart rate (77%), vaginal examination (71%), and tetanus vaccination (73%). The mean number of items reported was seven.

The majority of women (76%) reported nine items or less, the remainder (24%) reported ten items or more. Only 86 women (10%) reported all items.

Multivariate regressions

Results of logistic regression are presented in Table 3. At the provincial level, living in Quang Ngai reduced ANC content reported compared to living in Long An (OR = 0.3, 95% CI = 0.2-0.6).

The providers' characteristics associated with fewer items reported were private ownership of the health facilities (OR = 0.4, 95% CI = 0.2-0.7 vs public facilities) and health care providers being nurses or assistance doctors (OR=0.6, 95% CI = 0.3-0.9 vs doctors and/or midwife).

The women's characteristics associated with more items reported were being housewives (OR = 1.7, 95% CI = 1.0-2.8 vs farmers), consumption of iron/folate tablets (OR = 4.2, 95% CI = 2.2-8.2 vs no consumption of iron/folate tablets), and more sufficient utilization of ANC (OR = 2.1, 95% CI = 1.4-3.2 for sufficient utilization and OR = 3.8, 95% CI = 2.1-7.0 for sufficient plus vs insufficient utilization of ANC), more perceived helpfulness of ANC (OR = 3.0, 95% CI = 1.9-4.8) and high global satisfaction score with ANC received (OR = 1.6, 95% CI = 1.0-2.6). Factors associated with fewer items reported were having no intention to be pregnant (OR = 0.5, 95% CI = 0.3-0.9).

The linear regression model explained a large proportion of the variation in the number of ANC content items reported (39%). The provider context made the greatest contribution (12%), followed by women process (11%), women outcome (9%), and macro context (6%). The women context accounted for minimal variation (1%).

DISCUSSION

The ANC content reported by the women was poor. Only 24% reported fair ANC content. Significant variation existed between subgroups of women with a number of factors associated with ANC content reported.

Province of residence, the only variable in the macro context, accounted for a substantial variation (6%). The main possible reason for the poorer ANC content reported in Quang Ngai was lower economic status. Gross domestic product (GDP) in Quang Ngai was VND 2.2 million in 1999, which was much lower than VND 4 million in Long An and VND 3.5 million in Ben Tre (MoH, 1999). There may have been less funding for health care services, poorer quality, and fewer choices for women. In addition, it was possible that the ANC services were not affordable for the women of Quang Ngai, or they may not have been a demand for quality services.

The findings were similar with the results of other studies on the significance of public/private ownership of health facilities (Kotelchuck *et al*, 1997) and the quality of ANC providers (Peoples-Sheps *et al*, 1991). Public health facilities in Vietnam have been funded by the socialist government for decades. About 95% of the communes in the country have a community health center, which are staffed by nurses, midwives, and, in many areas, by doctors (MoH, 1999). A review reported that public health facilities have sufficient capacity to deliver basic ANC (Nhan *et al*, 2000). In contrast, the private sector has

Table 3
Factors associated with reported ANC content, reduced logistic regression model (n = 857).

| | OR | 95% CI | |
|--------------------------------|------------------|--------|-----|
| Macro context | | | |
| Province of residence | | | |
| Long An (reference) | | | |
| Ben Tre | 0.8 | 0.4 | 1.5 |
| Quang Ngai | 0.3 ^a | 0.2 | 0.6 |
| Provider context | | | |
| Place where ANC was delivered | | | |
| Public (reference) | | | |
| Private | 0.4 ^a | 0.2 | 0.7 |
| Qualification of ANC providers | | | |
| Doctor, midwife (reference) | | | |
| Assistant doctor, nurse | 0.6 ^a | 0.3 | 0.9 |
| Women context | | | |
| Woman's occupation | | | |
| Farmer (reference) | | | |
| Non-farmer | 1.2 | 0.7 | 2.0 |
| Housewife | 1.7 ^a | 1.0 | 2.8 |
| Planned pregnancy | | | |
| Yes (reference) | | | |
| No | 0.5 ^a | 0.3 | 0.9 |
| Women process | | | |
| Iron/folate supplements | | | |
| No/not remember (reference) | | | |
| Yes | 4.2 ^a | 2.2 | 8.2 |
| ANC utilization | | | |
| Insufficient (reference) | | | |
| Sufficient | 2.1 ^a | 1.4 | 3.2 |
| Sufficient plus | 3.8 ^a | 2.1 | 7.0 |
| Women outcome | | | |
| Helpfulness of ANC received | | | |
| 0-3 uses (reference) | | | |
| 4-6 uses | 3.0 ^a | 1.9 | 4.8 |
| Satisfaction with ANC received | | | |
| 5-8 score (reference) | | | |
| 9-10 score | 1.6 ^a | 1.0 | 2.6 |

^ap<0.05

been established recently with the opening of a market economy; primarily run by public health staff working after normal working hours and often in their own homes. It has been reported that the private health sector service delivery was of poorer quality than that of the public health sector (Tuan, 2004). The quality

of the ANC providers also had a great impact on the quality of care. Doctors and midwives are more qualified and more specialized to care for pregnant women; therefore, they delivered more ANC content than assistant doctors and nurses did.

Women process influenced ANC content

in that, the more the women utilized ANC services, the more chances the ANC content items were delivered. This was consistent with the results of other studies (Peoples-Sheps *et al*, 1996; Kotelchuck *et al*, 1997). The women who took iron/folate supplements were able to and more willing to pay for better health services. They might have had better knowledge and therefore more demanding for quality services.

Concerning the women outcome, the more the women were satisfied with the services provided, the more they came back for care and therefore received more ANC content.

In contrast to the above variables, the women context played a small role in the ANC content reported. The women context may have had more influence on the decision whether or not to enter ANC rather than to continue ANC and ANC content, which, as discussed above, were largely dependent on the interactions with ANC providers. The results are supported by other studies (Kogan *et al*, 1994; Peoples-Sheps *et al*, 1996) that household level factors, such as income or health insurance, were not significant.

The strengths of this study were that the sample size was large enough to gain precise estimates of ANC outcomes and to provide power to detect the main associations. Because of the randomly selected sample and the response rate of 85%, the studied subjects were expected to be reasonably representative of women in the three provinces. The study modified the widely used Donabedian quality of health model in the selection and analyses of variables. Although not all components of the model were examined, the included variables covered many dimensions in the model, and there were more variables analyzed in this study than in any other previous studies.

The study had several limitations. The data was collected some years ago, and in the meantime, the level of ANC content and

the associated factors in rural Vietnam might have changed. Some potentially important factors, such as gender of the ANC providers or years since graduation, were not examined. Recall bias was likely to have occurred. Nevertheless, this study is still the only source of information on factors associated with ANC content, not only in the three provinces, but also in the whole country.

In this study, ANC content depended primarily on the macro context, the provider context, the women process, and the women outcome. To reduce inequality between provinces, priority should be given to less developed provinces such as Quang Ngai. To improve ANC content within each province, use of public health facilities, doctors, and midwives for ANC should be encouraged. However, this is not an easy task because the public health sector may not be as attractive to some women as the private health sector despite an apparent better level of quality.

The reasons are that public health facilities only operate during business hours with no home visits, waiting times are long, and administration procedures are complicated. Furthermore, the costs are not cheaper than private facilities, the payments are not negotiable and can not be deferred, and patients may have to bribe staff to obtain services (Nhan *et al*, 2000; Tipping, 2000). In addition, most of the health workers are employed permanently by the government. For decades, public health has been the only choice; therefore, patient satisfaction is not a priority for government employees.

The results of this study should be applied to the development of ANC services, especially to the quality of ANC content (procedures and information). Further research should focus on such areas as policy analysis, especially concerning quality assurance in both private and public sectors; health service delivery, especially that related to off-hour

services; and human resource development, especially within the public sector. The quality assurance conceptual framework developed by this study should be further tested in Vietnam and supplemented with other quantitative as well as qualitative methods to identify the most appropriate ways to improve ANC content and to test the impact of quality improvement of health care facilities and staff on ANC content.

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REFERENCES

- Buekens P, Tsui A, Kotelchuck M, Degraft-Johnson J. Tetanus immunization and prenatal care in developing countries. *Int J Gynaecol Obstet* 1995; 48: 91-4.
- Cohen J, Cohen P. Applied multiple regression/correlation analysis for the behavioural sciences. 1st ed. Mahwah, NJ: Laurence Erlbaum, 1975.
- Donabedian A. The quality of care, how can it be assessed? *JAMA* 1988. 260, 12: 1743-48.
- Frenk J. Avedis Donabedian [Obituary]. *Bull World Health Organ* 2000; 78: 12.
- Handler A, Michele I, Bernard T. A conceptual framework to measure performance of the public health system. *Am J Public Health* 2001; 91: 1235.
- Holzemer L. The impact of nursing care in Latin America and the Caribbean: a focus on outcomes. *J Adv Nurs* 1994; 20: 5-12.
- Jahn A, Iang MD, Shah U, Diesfeld HJ. Maternity care in rural Nepal: a health service analysis. *Trop Med Int Health* 2000; 5: 657-65.
- Kogan M, Alexander G, Kotelchuck M, Nagey D. Relation of the content of prenatal care to the risk of low birth weight. Maternal reports of health behavior advice and initial prenatal care procedures. *JAMA* 1994; 271: 1340-5.
- Kotelchuck M, Kogan M, Alexander G, Jack B. The influence of site of care on the content of prenatal care for low-income women. *Matern Child Health J* 1997; 1: 25-34.
- MoH. Vietnam health statistic yearbook. Hanoi: Ministry of Health, 1999.
- MoH. National standards and guidelines for reproductive health care services. Hanoi: Ministry of Health, 2002.
- Nhan VQ, Mai LT, Hau NT, *et al*. A situation analysis of public sector reproductive health services in seven provinces of Vietnam. Hanoi: The Population Council, 2000.
- Peabody JW, Gertler PJ, Leibowitz A. The policy implications of better structure and process on birth outcomes in Jamaica. *Health Policy* 1998; 43: 1-13.
- Peoples-Sheps MD, Hogan VK, Ng'andu N. Content of prenatal care during the initial workup. *Am J Obstet Gynecol* 1996; 174: 220-6.
- Peoples-Sheps MD, Kalsbeek WD, Siegel E, Dewees C, Rogers M, Schwartz R. Prenatal records: a national survey of content. *Am J Obstet Gynecol* 1991; 164: 514-21.
- Sikosana P L. An evaluation of the quantity of antenatal care at rural health centres in Matebelel and North Province. *Cent Afr J Med* 1994; 40: 268-72.
- Tipping G. The social impact of user fees for health care on poor households. Hanoi: Health Policy Unit, Ministry of Health, 2000.
- Tuan T. Utilisation of health service in Vietnam. Newcastle, Australia: University of Newcastle. 2004: 345 pp. Dissertation.
- Trinh LTT, Dibley MJ, Byles J. Antenatal care adequacy in three provinces of Vietnam: Long An, Ben Tre and Quang Ngai. *Public Health Rep* 2006; 121: 468-74.
- WHO. Antenatal care. Report of a technical working group, 1994. Geneva: WHO. *WHO/FRH/MSM/96.8*. 1996.
- WHO/UNICEF. Antenatal care in developing countries, promises, achievements and missed opportunities. an analysis of trends, levels and differentials, 1990-2001. Geneva: WHO, 2003.