Non-traditional approach to measuring maternal mortality: using handheld technology in Sampling at Services Sites in Markets (SSS-M)

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OBJECTIVE: The Millennium Development Goal 5 - reducing the maternal mortality ratio by three quarters by 2015, clearly demands improved monitoring of maternal deaths. This presents a significant challenge in developing countries, where limited resources make it difficult to mount regular household surveys with sample sizes large enough to reliable measure levels and trends in maternal mortality. Based essentially on the direct sisterhood method, the new approach described here makes use of natural meeting point - markets, together with the Personal Digital Assistant (PDA) to collect data from women respondents more efficiently (quicker and cheaper) than a household survey. This study focuses on how representative such a sample is of the general population.

DESIGN: A pilot study was conducted in the district of Houndé (Southwest Burkina Faso) in October 2005. Women were sampled from 32 markets out of a total of 63 in the district. Female vendors and customers aged between 15 and 49 years were questioned on their demographic and socio-economic characteristics, their fertility, and the survival or pregnancy-related deaths of their adult sisters. 'Direct sisterhood method' questions, adapted from the Demographic and Health Survey (DHS) questionnaire, were used to estimate maternal mortality indicators among the sisters of the respondents. A qualitative study was also done to ascertain the barriers and the favourable factors to conducting a study in this setting. After this promising pilot study, a full field trial of Sampling at Services Sites in Markets (SSS-M) seized the opportunity of a recent census in the district of Ouargaye (East Burkina Faso) to validate this new approach to estimating maternal mortality. During the pilot study paper-based questionnaires were used to collect data, but in this validation phase, electronic data collection was done using PDAs. To assess the quality of data collection with this new tool in a rural setting, women were randomly selected to be re-interviewed by the supervisors using paper questionnaires.
The focus of this paper is a comparison between the demographic and socio-economic characteristics of the respondents in the two markets surveys with existing community censuses in Houndé and Ouargaye districts. Household characteristics (ownership of named assets, composition of floor and roof, water source, availability of electricity and toilet facilities) were compared directly between the data sets. The same characteristics were also combined using factor analysis into poverty-quintiles using the method described by Gwatkin *et al*. (2000). Factor loadings and cut-offs obtained in one of the community survey data sets were applied to the SSS-M data to produce comparable poverty scores.

FINDINGS: During the Hounde pilot study, a total of 5022 women were interviewed by ten interviewers over 23 days. The socio-economic characteristics of the respondents were similar to those of the wider community, as represented in the census data. Comparison of poverty quintiles between the SSS-M sample and the census showed very similar proportions of women in the poorest category (14.1% *vs* 14.8%), the richest category (21.3% *vs* 24.7%) and the middle category (17.9% *vs* 19.1%). However the intermediate quintiles showed some differences between the samples, with a bias towards richer women in the SSS-M sample (second poorest quintile: 8.8% in Markets *vs* 18.6% in SAREDO; second richest quintile: 40.0% *vs* 22.7%). The five-year gap between the 2 data sets, and the possible influence of

Hounde being the cotton belt in Burkina Faso and experiencing a major increase in cotton production between 2001 and 2006, may explain this difference.

The data from the recent census (June 2006) in the Ouargaye district was compared with that from a full field trial of SSS-M, with 16,606 women interviewed in the 39 markets by 20 field workers in 5 weeks in the same district. The demographic (age, education, marital status) and socio-economic characteristics (ownership of cart, tractor, radio, television, motorbike, car, composition of floor and roof, water source, availability of electricity) of the respondents were also comparable to the women at the reproductive age (WRA) from the census. Some small differences shown in the ownership of named assets may be due to differences in interpretation of the questions.

CONCLUSION: The trial of SSS-M revealed markets to be a feasible and efficient setting for data capture. Moreover, the market survey was quicker and cheaper than a household survey. In Hounde, 5,022 women were interviewed in the markets in 3 weeks by 10 field workers versus 1,276 women in the same period by the same number of interviewers. During the validation survey in Ouargaye, 20 interviewers recruited 16 622 women in 5 weeks. The difference in costs was US$ 8 per woman (US$ 3 for markets survey and US$ 11 for the household survey). These results indicate the usefulness of the new approach for resource poor countries, with limited information systems.