

Using critical link methodology in health-care systems to prevent maternal deaths

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Critical link methodology (CLM) examines each maternal death as a sentinel event. It reviews all the health-care interactions between a woman and health personnel prior to her death, providing a timeline of health-seeking actions and corresponding care provision across the health system.

CLM assesses health care through three dimensions:

- clinical performance (delays, omissions and compliance with quality standards compared to established guidelines).
- internal hospital organization.
- continuity of care between health-care facilities.

Through this process of review, CLM focuses on those crucial interventions that, if provided in an expeditious manner, can avert future maternal deaths. It enables safe motherhood committees to shift their focus from a medical cause of death to a managerial perspective of missed opportunities. This change in perspective is highlighted through the following lines of enquiry:

- *During which interactions between the woman and the health system could the condition leading to her death have been better addressed?*
- *Based on this analysis, what specific steps must be done differently in the future to prevent the deaths of women in similar circumstances?*
- *To sustain these specific changes, what processes in each care unit require modification to ensure quality of care, and what factors of the health system should be redesigned to ensure the continuity of care during obstetric emergencies?*

Furthermore, the comparison of near-miss cases (complications that lead to severe morbidity but which ultimately do not prove fatal) with cases of maternal mortality highlights the imperative of timely provision of care. This has resulted in a new category of analysis: therapeutic time interval, which calls for clinical research to establish the time interval during which interventions are effective. The therapeutic time interval helps demonstrate that even when appropriate treatment is provided, it may fail to save women's lives unless applied in a timely manner.

From single-case red alerts to further research

Open and regular communication between CLM field supervisors and federal authorities ensured that alerts detected by individual case studies spurred further analysis of routine data systems (hospital registries of 1,029,000 obstetric patients yearly from 617 public hospitals) to explore the magnitude and distribution of these gaps in maternal care across the health system.

One such example is provided by a CLM study of women with post-partum haemorrhage who died as they were transferred from community hospitals to referral hospitals. The assessment identified the lack of stabilization of women prior to transportation as a fatal omission. In the seven states where the percentage of maternal deaths due to post-partum haemorrhage was above the national average, up to 60 per cent of maternal deaths occurred while transporting patients to larger hospitals. When ambulances and trained personnel were provided in one of those health districts, the maternal mortality rate from post-partum haemorrhage fell by 30 per cent the following year.

CLM is helping to redesign the way facilities are networked in each district health system. In addition, applying CLM necessitates involving a broader group of stakeholders than those traditionally engaged in safe motherhood committees, i.e., heads of clinical laboratories and blood banks, as well as health district administrators.

One outcome of CLM is that the reproductive health divisions at both the Ministry of Health and the Instituto Mexicano de Seguridad Social (IMSS, the Mexican social security system) now report the Causes of maternal deaths not only as medical causes, like "pre-eclampsia, sepsis, etc.," but also by detected failures in the process of care. For example, the report of maternal mortality of a given district or state health system will now state, "15 per cent of maternal deaths due to lack of IV solutions in health centres leading to failure to stabilize the women before transfer" or "10 per cent of maternal deaths due to delays in bringing in the surgeon on call to district hospitals during weekends." Seeing beyond the medical causes helps to diagnose health-system failures which, if immediately addressed, will avert maternal deaths.

See References, page 111.