

# BMJ Open Facilitators and barriers to quality of care in maternal, newborn and child health: a global situational analysis through metareview

Manisha Nair,<sup>1</sup> Sachiyo Yoshida,<sup>2</sup> Thierry Lambrechts,<sup>2</sup> Cynthia Boschi-Pinto,<sup>2</sup> Krishna Bose,<sup>2</sup> Elizabeth Mary Mason,<sup>2</sup> Matthews Mathai<sup>2</sup>

**To cite:** Nair M, Yoshida S, Lambrechts T, *et al*. Facilitators and barriers to quality of care in maternal, newborn and child health: a global situational analysis through metareview. *BMJ Open* 2014;**4**:e004749. doi:10.1136/bmjopen-2013-004749

► Prepublication history and additional material is available. To view these files please visit the journal. (<http://dx.doi.org/10.1136/bmjopen-2013-004749>).

Received 27 December 2013  
Revised 10 April 2014  
Accepted 2 May 2014



CrossMark

For numbered affiliations see end of article.

## Correspondence to

Dr Manisha Nair;  
manisha.nair@npeu.ox.ac.uk

## ABSTRACT

**Objective:** Conduct a global situational analysis to identify the current facilitators and barriers to improving quality of care (QoC) for pregnant women, newborns and children.

**Study design:** Metareview of published and unpublished systematic reviews and meta-analyses conducted between January 2000 and March 2013 in any language. Assessment of Multiple Systematic Reviews (AMSTAR) is used to assess the methodological quality of systematic reviews.

**Settings:** Health systems of all countries. Study outcome: QoC measured using surrogate indicators—effective, efficient, accessible, acceptable/patient centred, equitable and safe.

**Analysis:** Conducted in two phases (1) qualitative synthesis of extracted data to identify and group the facilitators and barriers to improving QoC, for each of the three population groups, into the six domains of WHO's framework and explore new domains and (2) an analysis grid to map the common facilitators and barriers.

**Results:** We included 98 systematic reviews with 110 interventions to improve QoC from countries globally. The facilitators and barriers identified fitted the six domains of WHO's framework—information, patient–population engagement, leadership, regulations and standards, organisational capacity and models of care. Two new domains, 'communication' and 'satisfaction', were generated. Facilitators included active and regular interpersonal communication between users and providers; respect, confidentiality, comfort and support during care provision; engaging users in decision-making; continuity of care and effective audit and feedback mechanisms. Key barriers identified were language barriers in information and communication; power difference between users and providers; health systems not accounting for user satisfaction; variable standards of implementation of standard guidelines; shortage of resources in health facilities and lack of studies assessing the role of leadership in improving QoC. These were common across the three population groups.

**Conclusions:** The barriers to good-quality healthcare are common for pregnant women, newborns and

## Strengths and limitations of this study

- This is the first comprehensive synthesis of robust evidence from systematic reviews to identify barriers and facilitators to improving quality of healthcare for pregnant women, newborns and children.
- This metareview provides a situational analysis of the cross-cutting issues in achieving quality of care (QoC) for maternal, newborn and child health using an existing WHO's framework for organisational management strategies.
- The process of interpreting evidence from the literature and using it to recommend priorities in practice and policy to improve QoC is complicated. There is neither a single definition of QoC nor are there set criteria against which QoC could be measured. This metareview was conducted within these limitations.
- There could be many other unidentified facilitators and barriers to improving QoC, particularly country-specific issues, but this metareview of systematic reviews could be considered to be the first step in exploring and compiling the existing knowledge about the global situation.
- This metareview could be particularly informative for policy makers as a guide to evidence-based effective interventions which can be adopted to strengthen the health systems of countries.

children; thus, interventions targeted to address them will have uniform beneficial effects. Adopting the identified facilitators would help countries strengthen their health systems and ensure high-quality care for all.

## BACKGROUND

The persistent problems of high maternal, infant and child morbidity and mortality<sup>1–4</sup> demand improved healthcare which does not pertain to coverage of health services alone.<sup>5</sup> Recently, there is a growing interest in the

**Figure 1** The six domains of quality interventions (source: WHO<sup>8</sup>).



quality of healthcare services provided.<sup>6 7</sup> The health issues of pregnant women, mothers, infants and children cannot be addressed without due attention to quality of care (QoC) for the simple reason that the healthcare services will not be effective, efficient, acceptable and safe.<sup>8</sup> However, it is not easy to conceptualise QoC and there are several definitions. Avedis Donabedian,<sup>9</sup> a pioneer in introducing QoC into the health system, defined QoC as:

that kind of care which is expected to maximise an inclusive measure of patient welfare, after one has taken account of the balance of expected gains and losses that attend the process of care in all its parts.

The WHO provides a framework of organisational management strategies to improve QoC (figure 1) in order to help the healthcare system achieve its desired goals.<sup>8</sup> This is a general framework which suggests that overall the health systems should focus on improving six domains of organisational management strategies to improve QoC—information, leadership, engagement with patients and population, use of regulation and standards, developing organisational capacity and models of care.<sup>8</sup> However, it is not known to what extent the current global issues in improving QoC for maternal, newborn and child health fit into the WHO framework. The objective of this study was to conduct a global situational analysis to identify the current facilitators and barriers to improving QoC for pregnant women, newborns and children with respect to the WHO's quality improvement framework.

## METHODS

We conducted a metareview of high-quality systematic reviews and the grey literature which examined QoC from a health system's perspective. All efforts were made to adhere to the underlying principles of 'reproducibility

and transparency' in conducting metareviews.<sup>10</sup> The scope of this metareview was to identify facilitators and barriers to QoC from the health system's perspective; thus, the primary outcome of interest was QoC. Since there is neither a single definition of QoC nor a single method to measure QoC, we used the six desired goals of the health system—effective, efficient, accessible, acceptable/patient centred, equitable and safe<sup>8</sup> as surrogate indicators of QoC for the purpose of conducting the literature searches. We restricted the metareview to published and unpublished systematic reviews and/or meta-analyses of interventions to improve QoC in the areas of maternal, newborn and child health between January 2000 and March 2013. No language restriction was applied. We excluded systematic reviews/meta-analyses of therapies and drug interventions, and of specific disease or health conditions. There is a wide range of literature on these topics; hence, it is a subject of specialised review. Other exclusion criteria were—systematic reviews withdrawn by the journal/authors due to any reason and systematic reviews of health promotion strategies/programmes undertaken by sectors other than the health sector. Databases searched for published literature were Cochrane, MEDLINE, EMBASE, CINAHL (Cumulative Index to Nursing and Allied Health Literature), PubMed Clinical Queries, Database of Abstracts of Reviews of Effects (DARE), Health Services Research (HSR) PubMed Queries and Regional databases of the WHO—Global health library. In addition, we hand searched all 16 volumes of the journal—*Quality and Safety in Health Care* (previously *Quality in Health Care*)—and the reference lists of the included studies. The grey literature searches were restricted to dissertations, reports and conference proceedings. The two recognised databases 'Index to theses' and 'Proquest Dissertations and Theses' were used. In addition, a number of databases in the areas of health services, QoC,

### Box 1 Scope of the six strategic organisational management domains of the WHO's health systems framework for improving quality of care (QoC)

1. *Leadership* is the first domain in the framework because a strong and committed leadership is considered to underpin the other five domains. While the framework suggests the requirement of effective leadership at all levels that is external and internal to the health system, this metareview focused only on 'leadership' within the healthcare system.
2. *Information* includes an information system in any shape and form (papers, checklists to computer-aided prompts) that enables service providers to deliver standard best practices and help patients and communities to manage their own health.
3. *Patient and population engagement* is described as central to quality improvement strategies because, 'either directly or indirectly, they will be financing care, they will be working in partnership with health workers to manage their own care and they will sometimes be the final arbiter of what is acceptable and what is not across all the dimensions of quality'. Thus, it is suggested that interventions are required to engage patients and communities in shaping the health system such that it is responsive to their needs. Within the scope of this domain are also included the strategies to improve health literacy, knowledge about self-care, users' engagement in decision-making, etc.
4. *Regulations and standards* based on evidence of best practices are required to be adhered to in order to improve the performance of the health system. They are the means for checking the credibility of the healthcare system and thus are usually monitored by an agency external to the health system. These agencies could be governmental or non-governmental, but their role is to inspect and accredit the healthcare systems. Although the WHO's framework includes 'audit' within the domain of 'organisational capacity' as a mechanism that supports organisations to improve quality, for the purpose of this review it was felt that 'audit' would fit best as a mechanism to ensure adherence to regulations and standards, thereby helping in improving QoC. Thus, any interventions related to audit were included under 'regulations and standards'.
5. *Organisational capacity* is the fifth domain and 'issues of quality within this domain apply throughout the health system' from the organisation and structure of the healthcare system to the knowledge and capacity of the service providers. This is suggested to be the interface at which providers and users interact and directly experience QoC-related issues.
6. *Models of care*, although included within the framework, do not fall under organisational management strategies. It is suggested that the interventions within 'models of care' should be such that they should aim to improve the continuum of care and all the other domains of organisational management for QoC and therefore may include strategies that extend beyond the health system. An example provided in the report is the 'Chronic Care Model' to improve QoC and management of chronic diseases. However, for the purpose of this review, only those models that were related to the health system were included.

maternal health, newborn health and child health were searched. Details of the database searches and key words are provided in online supplementary appendix A. The

11-item AMSTAR (Assessment of Multiple Systematic Reviews) tool was used to assess the methodological quality of the systematic reviews included in this study.<sup>11</sup> This tool has been used in other published metareviews<sup>12 13</sup> and is considered to be a valid and reliable instrument for assessing the quality of reviews.<sup>10 14</sup>

We used standard data extraction formats relating to methods, participants, intervention and outcome for each of the population groups (pregnant women, newborns and children). We used Donabedian's<sup>15</sup> suggested approach to organise the extracted data into the three levels of healthcare: structure (setting, material, human resource, organisational structures, regulations and standards); process (of giving and receiving care) and outcomes (improvements in health outcomes, health behaviours and patients' knowledge and satisfaction). This was performed to filter out data that did not relate to health systems and to organise the substantial amount of extracted data for ease of analysis. All efforts were made to adhere to Donabedian's<sup>15</sup> definition of 'structure', 'process' and 'outcome', but some information extracted from the literature could not be strictly fitted into any one category. In this case, the authors through a consultation process identified a category that was most suitable to house the information for the purpose of analysing the data. No attempt was made to use Donabedian's framework to analyse the data.

Data analysis was conducted in two phases

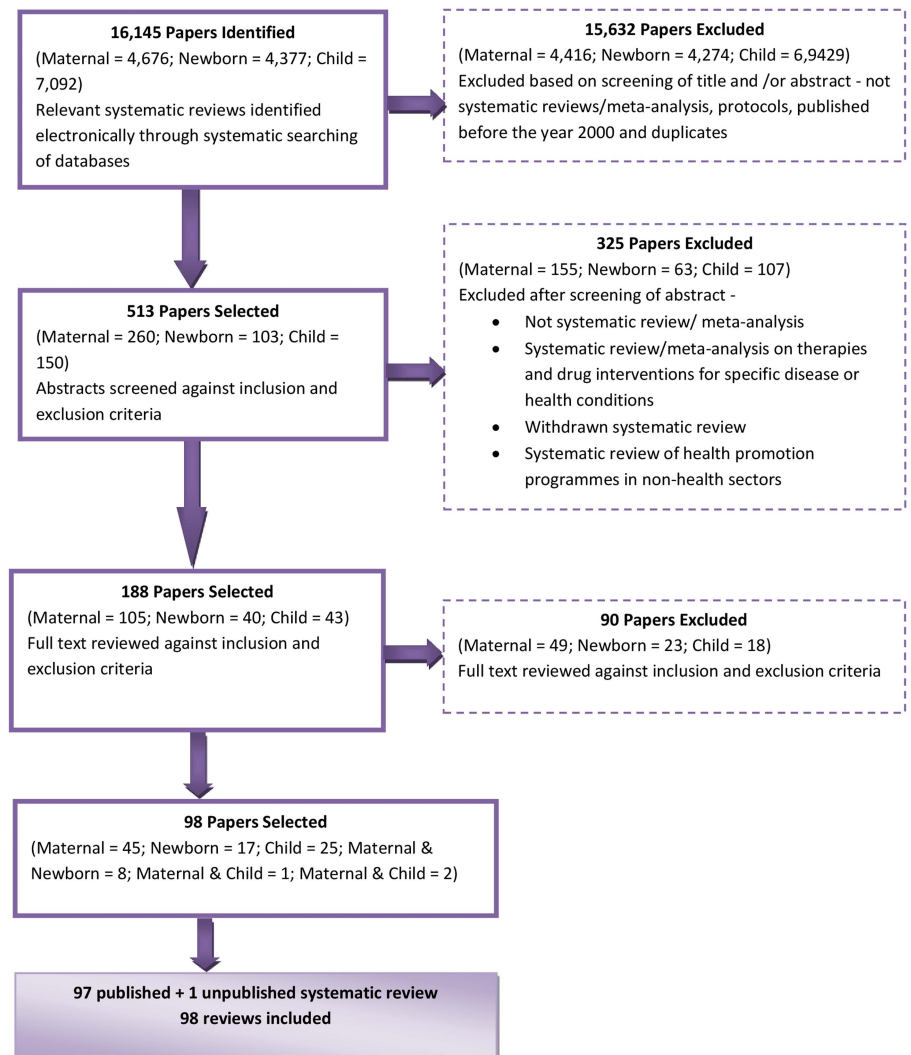
1. Qualitative synthesis of the extracted data to identify and group the facilitators and barriers to QoC for each of the three population groups (pregnant women, newborns and children) into the six domains of the WHO's framework (see [box 1](#) for brief description of the domains) and explore new domains (if any).
2. An analysis grid<sup>16-18</sup> was drawn on paper to aid the organisation of the phase-I findings to map the common facilitators and barriers to QoC across the population groups.

Considering the heterogeneity of the outcomes, interventions, population and settings, no attempt was made to conduct a metaregression of the reported meta-analyses data. MN carried out the searches, reviewed the papers and extracted the data which were assessed and finalised by all coauthors.

### FINDINGS

The details of the schematic search strategy for published literature are presented in [figure 2](#). We included a total of 98 systematic reviews—97 published and 1 unpublished; all were in English, except for one which was in Portuguese. The lists of included and excluded studies with reasons for exclusion are provided in online supplementary appendix B. A total of 1951 studies were included in the 98 systematic reviews (maternal=1178, newborn=359 and child=414) which comprised all types

**Figure 2** Process of selection of published literature through a systematic search strategy.



of study designs. The sample sizes ranged from 8 to 2 787 744; the sample populations were from rural and urban areas of countries belonging to all income groups (high-income, middle-income and low-income countries). AMSTAR scores ranged from 2 to 11 (details provided in online supplementary appendix C). Reviews with scores <3 are flagged to indicate poor methodological quality. Four systematic reviews (of 98) scored 2 on the AMSTAR tool, but these were not removed from the analysis in order to retain the comprehensive approach adopted for the review. The citations were managed using EndNote X5. The 98 selected systematic reviews included 110 interventions and the outcomes spanned the six goals of the health system—effective, efficient, accessible, acceptable, equitable and safe. Only a few papers explicitly set out to measure QoC as an outcome. One review used the Institute of Medicine’s QoC outcomes<sup>19</sup>; in two reviews, quality was defined in terms of adherence to standard guidelines such as active management of labour and continuity of midwifery care,<sup>20 21</sup> and in yet another in terms of augmentation of labour and delivery.<sup>22</sup>

### Facilitators and barriers to improving QoC with respect to the WHO’s framework

Within each quality domain of the WHO’s organisational management framework, facilitators and barriers to improving QoC identified from the review were further subdivided into the structure, process and outcome levels of healthcare (table 1). Two new domains were generated, ‘communication’ and ‘satisfaction’, for the priorities that could not be grouped under the six existing domains. ‘Communication’ was included as a subdomain under ‘information’ of the WHO’s framework and ‘satisfaction’ as a new domain.

### Information

Inadequate provision of information was an important barrier to improving QoC identified by users and providers.<sup>23–29</sup> A metasynthesis of the experiences of women from Australia, the USA, Finland, the UK, Canada and Japan, who underwent caesarean section, showed that they associated lack of information and knowledge with loss of control and powerlessness during the process of childbirth.<sup>23</sup> Another review of studies from the USA, the UK

**Table 1** Priorities in QoC

Population groups	Structure	Process	Outcomes
Information			
Maternal	Inability to understand the language and non-availability of qualified interpreters—barrier to information among the migrant population in Australia, Canada, the USA and a number of countries in Europe <sup>25</sup>	Information provided for the sake of providing <sup>30</sup> and information in the form of printed material, posters and didactic lectures <sup>26</sup> —not effective Pregnant women who carried their own case notes during pregnancy were reported to be well informed about their health condition <sup>28</sup>	The interventions related to providing information to pregnant women—giving women their own case notes to carry during pregnancy, <sup>28 55</sup> interventions using mobile phone text messaging services, <sup>34</sup> regular telephone contacts with nurses <sup>54</sup> and Pregnancy Care DAs <sup>42</sup> as modes of service delivery improved women's satisfaction and acceptability, but did not have any effect on pregnancy outcomes Telephone-based support for pregnant women improved healthy behaviour (reduced smoking and improved breastfeeding), and was effective in reducing low birthweight and preterm birth, but patients' acceptability and long-term effects were not known <sup>103</sup>
Newborn		Computerised Decision Support Systems improved efficiency of physicians and nurses in terms of minimising errors and reducing the time taken in calculating doses, <sup>31</sup> but its utility for diagnostic or prognostic purposes was not known <sup>31</sup>	
Child	Information systems such as PAC, <sup>32</sup> CPOE <sup>33</sup> and flow sheets for decision-making <sup>28</sup> —improve effectiveness of care, <sup>32</sup> efficiency of the care providers <sup>33</sup> and provider satisfaction <sup>28</sup>	Providing a child's progress chart <sup>29</sup> and health record <sup>28</sup> greatly improved parents' satisfaction with healthcare, <sup>28 29</sup> relieved their concerns and anxiety, and improved shared decision-making <sup>29</sup> Text messaging interventions were noted to have the potential to support health behavioural changes among older children in the short term and could add value to the provision of preventive health-related information, but long-term benefits for preventive healthcare were not known <sup>45</sup>	CPOE—minimised prescription errors and improved safety, but did not have any effect on clinical outcomes (AMSTAR <3) Nursing record systems that allowed parents to hold their children's medical records and systems for using flow sheets by providers for decision support were found to be acceptable by users and providers and increased provider efficiency, but did not have an impact on clinical outcomes <sup>28</sup>
Patient and population engagement			
Maternal	Women's and community's perception of quality of healthcare <sup>20 47</sup> and their past experiences <sup>25</sup> influence patient–population engagement Power difference between women and healthcare providers is an important hurdle in active engagement of users in decision-making <sup>30</sup>	Lack of effective interpersonal communication <sup>23 24</sup> and poor relationship between providers and users <sup>52</sup> Insensitive attitude and behaviour of providers undermine women's self-esteem and make them feel objectified <sup>24</sup>	A systematic review that assessed the impact of community participation on utilisation of skilled care for pregnancy, delivery and newborn care suggested that community participation was beneficial in increasing demand for information, improving care practices, enhancing provider

Continued

Table 1 Continued

Population groups	Structure	Process	Outcomes
	Costs of healthcare including distance and transport costs <sup>25 46 47 104</sup> and lack of attention to demand generating strategies within the health system could be other barriers <sup>75</sup> Lack of health literacy, knowledge and awareness are important structural barriers <sup>25 36 46 47</sup>	Respect, confidentiality and healthcare providers' time and attention influence user satisfaction and thus engagement with the healthcare system <sup>47 54</sup> Programmes with passive community involvement, low frequency of contacts with healthcare providers or those that provide education without focusing on the actual problems were generally found to be ineffective <sup>105</sup>	accountability and increasing utilisation of antenatal and delivery care services, but it failed to improve health seeking for the newborn during illness <sup>106</sup>
Newborn	CHWs were effective in raising awareness and educating parents and caregivers about newborn care, especially in resource limited settings <sup>86 93</sup>	Training materials for CHWs prepared involving community support groups and/or women's group were beneficial in educating and improving knowledge and awareness of CHWs on birth and newborn care <sup>93</sup> Family-community service delivery mode has the highest impact on continuum of care (from pregnancy, through child birth to newborn care) <sup>107</sup> Community-based interventions such as women's group and action learning cycle, essential newborn care, behaviour change and illness recognition and birth preparedness <sup>48</sup> improve care seeking	Telemedicine technology focused on education and support of parents and carers of newborns receiving intensive care could improve carer satisfaction, but was not effective in reducing the length of hospital stay <sup>67</sup>
Child	'Family-centred care'—shown as effective and acceptable in a review of studies from Australia, <sup>108</sup> but the review lacked methodological rigour (AMSTAR score <3) A systematic review that included studies from 11 countries worldwide (including many LMICs) demonstrated that parents/family members had little negotiation power and that responsibilities were given to the parents irrespective of their choice, 'as seen fit by the experts' <sup>53</sup>	Lack of effective communication between providers and parents was an important process barrier that negatively affected parents' satisfaction and their engagement in healthcare <sup>37 38 43 51</sup> Interventions such as video games were particularly suited for making monotonous, repetitive tasks more compelling among children, but did not have a significant effect in improving self-management of diseases, physical activity or health education <sup>44</sup>	Biomedical informatics was suggested to improve quality of care provision, have an overall positive effect on adherence to clinical guidelines and improve patient safety through a reduction in errors. <sup>43</sup> Although this was acceptable, safe and effective, its long-term effects on clinical outcomes are not known and may not be applicable in all settings <sup>43</sup>
Regulations and standards			
Maternal	Strategies for integrating community-based maternal, newborn and child health interventions for care during childbirth through the primary care centres in LMICs lacked the universally agreed minimum set of interventions <sup>75</sup> Packages of care were mostly bundled for convenience of management rather than as	Lack of regular quality supervision and evaluation was an important challenge in improving the effectiveness of standard care practices. <sup>72 75</sup> Audit and feedback is a useful tool in improving adherence to regulations and standard care and improving their effectiveness across countries worldwide. <sup>20 26 76–78</sup>	A review that evaluated the impact of standard packages of care during childbirth to reduce caesarean section rates showed that though implementing standard care can improve health outcomes (effective), it may not necessarily improve patient satisfaction (acceptability). <sup>56</sup> Abolition of user fees increased utilisation of

Continued

Table 1 Continued

Population groups	Structure	Process	Outcomes
	evidence of efficacy <sup>56</sup> Despite abolition of user fees, existence of informal charges was reported, which in turn acted as a deterrent to utilisation of healthcare services <sup>47</sup>		institutional delivery services in LMICs, but it also increased the patient load which could not be catered to by the existing staff and other resources, thus compromising effectiveness in terms of pregnancy outcomes, mortality and morbidity. <sup>104</sup>
Newborn	The structural barriers to adherence to standards of mother/baby skin-to-skin care or Kangaroo care were reported to be lack of appropriate room temperature, privacy, modesty and overcrowding in the hospitals, and supplemental bottle or pacifier use <sup>74</sup> Another review suggested that considerable time and effort is required in implementing the initiative and unfavourable labour unit organisation and midwives' attitude to changes could augment the challenges <sup>109</sup>	With regard to the BFHI, in addition to issues of health system organisation, cultural practices in different country settings could also determine adherence to standard care <sup>73</sup>	A systematic review of studies from 11 countries worldwide showed that all 10 steps recommended in the BFHI may not be required, but it is also not known which steps are more important <sup>73</sup> The review of early skin-to-skin care using studies conducted in 18 countries worldwide could not demonstrate any effect of this recommended care on duration of breastfeeding, infant weight gain, maternal bonding, heart and respiratory rate of infants, admissions to intensive care units and length of hospital stay for infants <sup>74</sup>
Child		Audit and feedback is an important tool in improving the effectiveness of the healthcare services, but challenges related to cost and methods of implementation have to be overcome <sup>79</sup>	IMCI—there was evidence of effectiveness of this strategy in improving health outcomes demonstrated by studies from 17 LMICs <sup>51</sup>
Organisational capacity			
Maternal	Resources—shortage of healthcare workers including health professionals and CHWs and issues related to their retention were important barriers to QoC <sup>75 80</sup> Non-availability of drugs and necessary equipment could compromise quality and thus health outcomes <sup>47 82</sup> Shortage of skilled health professionals <sup>22 47 75</sup> and gap between providers' skill and knowledge were also highlighted <sup>22</sup> Role of training was significant in improving knowledge of healthcare providers, which in turn increased their level of confidence in delivering services <sup>91–93</sup> and enabled them to increase adherence to regulations and standards <sup>21 92</sup> —but challenges identified were the need to reinforce good practices through adequate supervision, <sup>110</sup>	Insensitive, rude, unfriendly and uncaring attitude <sup>23 24 52</sup> of providers can lead to high levels of dissatisfaction among women and have a negative effect on trust and acceptability of healthcare services <sup>52</sup>	Interventions to improve access to skilled birth attendance, EmOC, etc, did not necessarily improve their utilisation due to issues related to other factors within the 'organisational capacity' such as costs, quality, resources and waiting times <sup>47 52</sup> Trade-off was observed between women's acceptability and concerns of safety associated with planned home-based delivery or abortion or induction of labour <sup>59 68 82 89 90</sup>

Continued

Table 1 Continued

Population groups	Structure	Process	Outcomes
Newborn	<p>need for refresher courses, lack of standard tools to evaluate the impact of training on health system goals,<sup>91 110</sup> high costs, lack of capable trainers and need-based educational training programmes<sup>92</sup></p> <p>Settings other than the clinics and hospitals, such as home, maternity waiting facilities and outpatient setting, were relatively more successful in improving patient satisfaction and were at least as effective as the hospitals in terms of the maternal health outcomes.<sup>61 68 82 87</sup> However, the safety of such settings could not be ascertained, particularly safety related to planned home births/abortion<sup>59 82 89 90</sup> and induction of labour in home or community setting<sup>68</sup></p> <p>Long waiting time was an important issue that compromised acceptability of care among women noted in several reviews<sup>24 25 47 52</sup></p> <p>Lack of adequate skills of healthcare providers, especially CHWs and TBAs, was a matter of concern<sup>107</sup></p> <p>Midwife-led care compared with physician care was suggested to be effective in improving newborn health outcomes in studies from HICs,<sup>60</sup> but the AMSTAR score for this review was &lt;3 indicating methodological concerns</p> <p>The systematic review that examined the effects of planned home birth compared with planned hospital birth showed a significantly higher risk of neonatal death in the home-birth setting<sup>82</sup> (AMSTAR &lt;3)</p> <p>Community-based packages were shown to be effective in substantially reducing newborn death, but appropriate packaging and implementation of evidence-based interventions with high coverage and quality in large programmes remained a challenge<sup>111</sup> (AMSTAR &lt;3)</p> <p>Training programmes had a beneficial effect on provider skills and performance, improved their adherence to standard protocols and enabled them to manage patients better,<sup>92-94</sup> but the clinical skills of providers tended to decay over time and</p>	<p>Midwives' attitude towards change was found to be a hurdle in successful implementation of early skin-to-skin care of newborns<sup>109</sup></p>	<p>Trained CHWs were effective in creating awareness about newborn care in the community, which was associated with a decrease in infant mortality, especially in resource-poor settings<sup>85 86</sup> There were legal and ethical issues involved in treating neonates by CHWs with injectable or oral antibiotics<sup>85</sup></p>

Continued



Table 1 Continued

Population groups	Structure	Process	Outcomes
Child	<p>thus need to be reinforced with refresher training programmes which can be costly<sup>94</sup></p> <p>CHWs were reported to be effective in improving uptake of healthcare services and promoting healthy behaviours in the communities, especially in the economically disadvantaged communities<sup>83 84</sup></p> <p>Another review that assessed the impact of care by specialists compared with care by general practitioners and other primary care providers did not find any difference in parents' satisfaction and clinical outcomes in children<sup>70</sup></p> <p>Disparities in access to healthcare services and drugs, and providers' attitude were reported to be a matter of concern for children from the minority communities in the USA<sup>37</sup></p> <p>Community-based and home-based settings were acceptable and effective<sup>69 88</sup></p> <p>The hospital-based specialised units did not make much difference to these outcomes except for decreasing the costs for the hospitals<sup>71 112</sup></p>	<p>Regular interactions between patients and the primary care team was important<sup>38</sup></p> <p>Cultural insensitivity of providers is a key priority issue in QoC<sup>38</sup></p>	<p>Safety appeared to be a matter of concern due to the high reported medication errors which constituted a significant proportion of medical errors in children<sup>113</sup></p> <p>For children belonging to minority communities, accessibility, acceptability and equity were important matters of concern that needed special attention<sup>37</sup></p> <p>The trade-off observed was between improved acceptability and lack of effectiveness in certain interventions such as the nursing records system<sup>28</sup> and the paediatric hospitalist system,<sup>70</sup> but there was no evidence of any harm</p>
Communication Maternal	<p>Language barriers<sup>25</sup> and lack of qualified interpreters could pose a challenge to effective communication</p>	<p>Passive flow of information from providers to users was ineffective in improving women's knowledge and awareness about their health condition for shared decision-making<sup>30 40 41</sup></p> <p>Pregnancy care DAs that supported women in decision-making such as booklets, interactive computer programs and structured counselling significantly decreased decisional conflict and decisional regret, increased knowledge, decreased anxiety, reduced the proportion of women who were undecided and increased accuracy of risk perception<sup>42</sup></p> <p>Interactive workshops and educational meetings were beneficial in improving provider compliance to standard guidelines compared to receiving information leaflets and didactic lectures<sup>26</sup></p>	<p>Group antenatal care as a model of care was shown to be effective in improving women's knowledge and satisfaction<sup>36 65</sup></p>
Newborn	<p>A systematic review that measured the impact of Remote Simultaneous Translation in improving quality of carer–physician communication found</p>	<p>A review found that regular frequent discussions with healthcare providers were effective in encouraging mothers to initiate exclusive breastfeeding for newborns<sup>27</sup></p>	<p>The effectiveness of interventions for effective provider–carer communication in terms of health outcomes of newborns is not known, although it</p>

Continued

Table 1 Continued

Population groups	Structure	Process	Outcomes
Child	that the intervention enhanced provider and carer satisfaction <sup>50</sup> Language could be an important barrier for effective communication, especially among the minority population <sup>37–39</sup> Power dynamics in provider—parents/carer relationship was reported to be a barrier <sup>53</sup>	Active communication between providers and parents (use of biomedical informatics) <sup>43</sup> was more effective than passive ones such as video games and text messaging <sup>34 44 45</sup> Evidence-based discussions in the community and information campaigns may help to improve vaccine coverage <sup>88</sup>	was suggested to improve initiation of breastfeeding in one review <sup>50</sup> A systematic review examined a number of health Information Technology strategies (video games, computerised assessments, physician training, web-based communication, infant progress chart), which can play a role in improving provider–patient communication <sup>29</sup>
Satisfaction Maternal	A systematic review that assessed the utility of criterion-based audit in improving the quality of obstetric care did not find any published study on the use of audit to improve the quality of healthcare from the women's perspective <sup>26</sup>	Ability to be in control during pregnancy and labour, which is determined by effective communication leading to empowerment and active involvement in decision-making, <sup>23</sup> was reported to be associated with enhanced satisfaction among women <sup>90</sup> Comfort and support were identified as important factors that determine satisfaction <sup>23 54 61</sup> Care provision during labour and birth in a healthcare setting other than the labour room was perceived to be more satisfactory because women felt that they had more freedom to express their feelings, received support from midwives and were involved in decision-making <sup>61</sup> A review that assessed the effect of continuous support by caregivers during labour and birth on maternal health outcomes found that 20 of the 22 included trials specifically mentioned about a comforting touch and words of praise and encouragement, which greatly improved women's satisfaction with care as well as their health outcomes <sup>64</sup>	Interventions that allowed women to keep their case records, <sup>28 55</sup> and those that used mobile phone text messaging as the mode of service delivery <sup>34</sup> and DAs, as discussed above, <sup>42</sup> increased satisfaction, but were not found to have any effect on clinical outcomes
Newborn	Effective communication <sup>50</sup> and interventions that improved education and awareness about newborn care <sup>67</sup> increased family and carer satisfaction with healthcare provided to newborns	Telemedicine technology focused on education and support of parents and carers of newborns receiving intensive care was shown to be associated with improvements in family satisfaction with the overall quality of care and environment and visitation dimensions <sup>67</sup> The benefits of e-based support for successful breastfeeding was reported to be related to enhanced confidentiality, anonymity and more	The telemedicine intervention improved carer satisfaction and thus acceptability, but had no effect on the length of hospital stay of infants <sup>67</sup> Similarly, the e-based support for breastfeeding was acceptable to mothers, but it did not have any effect on breastfeeding outcomes <sup>98</sup>

Continued

Table 1 Continued

Population groups	Structure	Process	Outcomes
Child	Specialist home-based nursing services were reported to increase parental satisfaction, reduce anxiety and improve family functioning, psychological adjustment and school attendance (but this was reported in only one study in the review) <sup>69</sup> Providers' attitude, such as friendliness, courtesy, <sup>70</sup> being approachable and attentive to parents'/carers' concerns, improved satisfaction <sup>71</sup>	comfort felt by mothers in talking about sensitive topics <sup>98</sup> Perceived support from health professionals was an important determinant of parents'/carers' satisfaction. <sup>45 71</sup> Active participation and shared decision-making in child's care was important <sup>29 108</sup>	Home-based care, <sup>69</sup> family-centred care <sup>108</sup> and parent-held child health records <sup>28</sup> were found to be acceptable Interventions that improved communication between healthcare providers and parents/carers <sup>29 43 50</sup> and comprehensive hospital-based care <sup>19</sup> improved acceptability as well as effectiveness

AMSTAR, Assessment of Multiple Systematic Reviews; BFHI, Baby Friendly Hospital Initiative; CHWs, community health workers; CPOE, Computerised Physician Order Entry; EmOC, Emergency Obstetric Care; DAs, decision aids; HICs, high-income countries; IMCI, Integrated Management of Childhood Illness; LMICs, low-income and middle-income countries; PAC, Paediatric Alert Criteria; TBAs, trained birth attendants; QoC, quality of care.

and Canada showed that lack of information on the full range of health services available was a major challenge for marginalised women to accessing healthcare.<sup>24</sup> Information provided merely for the sake of providing it was not considered to be of any use.<sup>30</sup> Information systems such as 'Computerized Decision Support Systems' for minimising errors in calculating medicine doses,<sup>31</sup> Paediatric Alert Criteria,<sup>32</sup> Computerized Physician Order Entry<sup>33</sup> and flow sheets for decision-making<sup>28</sup> improved effectiveness,<sup>31 32</sup> efficiency<sup>31 33</sup> and provider satisfaction.<sup>28</sup> Language was an important barrier to receiving adequate information among the migrant population.<sup>25</sup> A key finding was that all interventions to improve the provision of information among users and providers were found to be from high-income countries (HICs), except for one study in Thailand.<sup>34</sup>

### Communication

Effective 'communication' could be a bridge, linking information to health literacy, knowledge and awareness for shared decision-making and user satisfaction. The WHO's framework of organisational management strategies to improve QoC does not emphasise interpersonal communication as a specific strategy for improving QoC. However, issues related to 'communication' were highlighted in several studies.<sup>23 24 35 36</sup> Furthermore, a systematic review of interventions to improve communication between health professionals and pregnant women during maternity care suggested that improved interpersonal communication could increase acceptability and satisfaction,<sup>30</sup> but its AMSTAR score was <3 and thus ranked low in methodological quality.

As noted above, language barriers<sup>25 37-39</sup> and lack of qualified interpreters could also pose a challenge to effective communication. A passive flow of information from providers to users was not effective in improving users' knowledge and awareness about their health condition for shared decision-making.<sup>30 40 41</sup> The greatest benefits were observed when a decision support technique was implemented in the form of counselling from a care provider involving information, discussion of options and clarification of values.<sup>42</sup> Two reviews found that regular frequent discussions with healthcare providers were more effective than a one-off contact.<sup>27 35</sup> Active communication between providers and parents using biomedical informatics<sup>43</sup> was more effective than passive ones such as video games and text messaging services.<sup>34 44 45</sup> Interactive workshops and educational meetings were shown to be more beneficial in improving provider compliance to standard guidelines compared to receiving information leaflets and didactic lectures.<sup>26</sup>

### Patient and population engagement

Barriers to patient and population engagement were lack of health literacy, knowledge and awareness about health services,<sup>25 29 35 36 46-50</sup> lack of opportunity for shared decision-making<sup>38</sup> and lack of trust and

**Table 2** Common facilitators and barriers to improving QoC for pregnant women, newborns and children

Domains of QoC with respect to the WHO's framework	Barriers	Facilitators
Information	Language (particularly for migrants and the minority population) and lack of qualified interpreters Information provided for the sake of providing without active engagement with the users	Information provided through active and regular communication between the provider and the user Decision support systems could improve provider efficiency, effectiveness and safety of care
Communication	Gap in evidence related to information needs in LMICs Passive flow of information from providers to users	Active interpersonal communication  Continuous communication between healthcare providers and users rather than one-off contact Decision aids, such as pregnancy care decision aids, decrease user anxiety and improve engagement and satisfaction Interactive workshops and educational meetings for providers
Patient and population engagement	Users' and communities' perception of QoC Lack of adequate information Lack of effective interpersonal communication Insensitive attitude and behaviour of providers Power difference and poor relationship between user and healthcare providers	Respect in user-provider relationship Confidentiality of care Healthcare providers' time and attention Active involvement of the community
Satisfaction	Health systems in general do not account for user satisfaction Audits do not assess users' perspective (particularly that of women) Uncaring and disrespectful behaviour of healthcare providers Cultural insensitivity High costs and poor quality of healthcare, non-availability of resources and long waiting times	Community health workers to facilitate community engagement Engaging users in shared decision-making  Active involvement of users in their healthcare decision-making Comfort and support from healthcare providers  Continuity of care
Regulations and standards	Lack of strong evidence of effectiveness of standard care practices (EmOC, skilled birth attendance, mother/baby skin-to-skin care or Kangaroo care, BFHI) particularly in LMICs Variable standards of implementation of the standard guidelines (implemented for convenience of management rather than as evidence of efficacy)	Regular supervision  Audit and feedback could improve adherence to regulations and standard care
Organisational capacity	Shortage of healthcare professionals Non-availability of drugs and necessary equipment Gap between provider skills and knowledge  Irregular long working hours deter health professionals from providing quality care  Healthcare providers' attitude towards change	Effective training of healthcare providers Task shifting to address the shortage Training of healthcare professionals through need-based training programmes Reinforcing good practices through adequate supervision and refresher courses Settings other than clinics (such as home, community centres, etc) improve users' level of comfort and satisfaction Providers' competencies to build trust, comfort and patient-centredness over and above technical skills
Leadership	Lack of studies assessing the role of leadership in improving QoC	

Continued

Table 2 Continued

Domains of QoC with respect to the WHO's framework	Barriers	Facilitators
Models of care	Reduced number of antenatal visits with focused care was not found to be effective and acceptable in general and could compromise effectiveness in LMICs	<p>Models providing continuity of care (particularly for maternal and newborn healthcare)</p> <p>Models providing integrated and comprehensive care (integrated care pathway model)</p> <p>Care and support from alternative carers (trained doula, family-centred care)</p> <p>Group antenatal care rather than one-to-one care improves women's level of knowledge and satisfaction</p> <p>Communication and information through text messaging services, internet-based interventions, telemedicine and biomedical informatics had varying degrees of effect on user satisfaction and engagement</p>

BFHI, Baby Friendly Hospital Initiative; LMICs, low-income and middle-income countries; CHWs, community health workers; EmOC, Emergency Obstetric Care; QoC, quality of care.

confidence in the healthcare providers.<sup>37</sup> In addition, users' and community's perception of quality of healthcare<sup>20 47</sup> and their past experiences,<sup>25</sup> lack of effective interpersonal communication<sup>23 24 37 38 43 51</sup> and poor relationship between providers and users<sup>38 52</sup> were other important barriers. Power difference between users (women, parents and carers of children) and healthcare providers prevented active engagement of users in decision-making and was an important hurdle in patient and population engagement.<sup>30 53</sup> Respect, confidentiality and healthcare providers' time and attention were identified as other process-related factors from studies worldwide that influenced user satisfaction and engagement with the healthcare system.<sup>38 47 54</sup>

### Satisfaction

Several systematic reviews included in this metareview reported users' satisfaction with healthcare as key to their engagement<sup>22 28 34 36 40 42 45 50 54-67</sup> and thus merited an independent domain. The included systematic reviews highlight the problem of health systems not eliciting information about users' perception of care with regard to the provision and costs of healthcare as well as lack of standard tools to measure patient satisfaction. Health systems often do not account for users', particularly women's, perception and their opinion about the care that they receive.<sup>25 68</sup> Women's satisfaction with healthcare influences utilisation of health services<sup>22</sup> and their ability to be in control of their own health.<sup>55</sup>

Several factors were identified from the included reviews that improved user satisfaction, such as family-centred care in which parents actively participated in healthcare of their children,<sup>69</sup> effective communication<sup>50</sup> and interventions that improved education and

awareness about newborn care.<sup>67</sup> Users' dissatisfaction was mainly related to the uncaring, disrespectful, insensitive and abusive attitude of care providers,<sup>23 52 70 71</sup> but it was also found to be associated with practices that were not compatible with their culture<sup>22</sup> and concepts of health and illness.<sup>25</sup> Comfort and support were identified as other important factors which determined satisfaction.<sup>23 54 61</sup> However, the factors that improved satisfaction among providers were different from that of the users and included decision support systems and other technical supports.<sup>28 32 33</sup>

### Regulation and standards

The included systematic reviews that evaluated the impact of standard care practices such as Emergency Obstetric Care (EmOC), skilled birth attendance,<sup>72</sup> standard packages of care during birth,<sup>46 56</sup> Baby Friendly Hospital Initiative (BFHI),<sup>73</sup> Kangaroo or mother/baby skin-to-skin care<sup>74</sup> did not find strong evidence of their effectiveness in improving health outcomes, especially in low-income and middle-income countries (LMICs). However, effectiveness of the Integrated Management of Childhood Illness (IMCI) strategy in improving health outcomes was demonstrated by studies from 17 LMICs.<sup>51</sup> Lack of effectiveness of recommended standard care strategies could be related to a number of structure-related and process-related issues (table 1). Primarily, the packages of care were found to vary to a greater or lesser extent from recommended standards. In some instances, these were bundled for the convenience of management rather than as evidence of efficacy.<sup>56</sup> Lack of regular quality supervision and evaluation was an important barrier to improving the effectiveness of standard care

practices.<sup>72 75</sup> Audit and feedback could be a useful tool in improving adherence to regulations and standard care and improving their effectiveness across countries worldwide,<sup>20 26 76–79</sup> but there are challenges related to quality,<sup>26 77 78</sup> sustainability<sup>76</sup> and acceptance of audit,<sup>77</sup> especially when enforced by an external agency.<sup>76</sup>

### Organisational capacity

Shortage of healthcare workers and issues related to their retention were important barriers to QoC.<sup>75 80</sup> A few interventions suggested that task shifting could address these issues,<sup>60 81</sup> but reservations about task shifting<sup>75</sup> were a challenge which should be included under 'leadership'-related issues.<sup>75</sup> In addition, non-availability of drugs and necessary equipment could compromise quality and thus health outcomes.<sup>37 47 82</sup> Users' perception of provider skills and the actual gap between providers' skill and knowledge were important determinants of QoC.<sup>22</sup> Furthermore, the type of providers also had an impact on patient acceptability and health outcomes. Midwives and community health workers (CHWs) were found to be as acceptable and effective as doctors and specialists in studies from HICs,<sup>60 70 83 84</sup> but there were challenges related to their training, supervision and regulation.<sup>80 85 86</sup>

It was observed that settings other than the clinics and hospitals, such as the home, maternity waiting facilities and outpatient setting, were relatively more successful in improving user satisfaction and at least as effective as the hospitals in terms of effectiveness.<sup>61 68 69 82 87 88</sup> However, the safety of such settings could not be ascertained, particularly safety related to planned home birth/abortion<sup>59 82 89 90</sup> and induction of labour in the home or community setting.<sup>68</sup>

Provider attitude was an important factor determining QoC in healthcare provision. Training in general improved the providers' knowledge and level of confidence,<sup>91–94</sup> engagement and communication with the users<sup>80 95</sup> and enabled them to increase adherence to regulations and standards.<sup>21 92</sup>

### Leadership

As discussed in the WHO's general framework, leadership is central to the strategic management domains of QoC. However, issues related to 'leadership' were not perceptible from the included studies. Inability to identify priority issues does not indicate that 'leadership' as a strategic management domain is less important. On the contrary, it suggests that there is an urgent need for research in this area. However, it ought to be acknowledged that leadership issues are difficult to ascertain as there are no fixed criteria to measure the facilitators and barriers to effective leadership.

### Models of care

Among the models of care, those that provided integrated care,<sup>96</sup> continuity of care<sup>97</sup> and comprehensive care<sup>19</sup> had positive impacts on the health system goals.

However, trade-offs were observed for some interventions. For example, interventions to reduce the number of antenatal visits could reduce healthcare costs, but were found to be associated with more perinatal deaths in the reduced visit group, particularly in the LMICs, and less acceptable to pregnant women.<sup>57 58 66</sup> Reducing the number of antenatal visits in LMICs without improving care would increase the risk of adverse health outcomes considering the already compromised public health services in many LMICs.<sup>66</sup> Interventions that provided continuous support during labour improved maternal satisfaction and health outcomes, but the effects appeared to vary with the type of providers.<sup>64</sup> Health professionals were less effective than a trained doula or childbirth educator or a family member mainly because the health professionals, who had to balance their hospital duties along with provision of support, were unable to provide continuous undivided attention to women.<sup>64</sup> Furthermore, two systematic reviews that analysed the effect of a group model antenatal care compared with conventional one-on-one care found the group model to improve women's knowledge and satisfaction, but there was no evidence of the effect on health outcomes and provider satisfaction.<sup>36 65</sup> Although internet-based interventions to support successful breastfeeding were reported to be beneficial in terms of round-the-clock availability of support, time and travel savings for users, these were not found to have a significant effect on breastfeeding outcomes.<sup>98</sup> Another review that examined the effect of music as a therapy found positive effects on children's coping behaviour, but there was limited evidence of the effect on clinical outcomes.<sup>99</sup>

### Common facilitators and barriers to improving QoC for pregnant women, newborns and children

We found several facilitators and barriers to improving QoC to be common across the population groups within each of the eight domains (table 2). Interventions that involve delivery of information through active and regular communication between users and providers could improve users' knowledge, awareness and health literacy, which are important factors for patient and population engagement. 'Decision aids' for users could also be important tools of communication. Language could be a barrier to information and communication among certain population groups. Information systems such as 'decision support systems' could improve providers' efficiency and help them adhere to standard care guidelines and regulations.

In addition to adequate information and effective communication, understanding users' perception about QoC is important in 'patient and population engagement'. There is lack of evidence with regard to the concerted efforts made by health systems to assess users' perception. Another issue within this domain that needs attention is that of trust and confidentiality. The ability of users to trust and confide in the providers is

important. This also relates to issues of insensitivity, inappropriate attitude and behaviour on the part of the providers. Training and regular audit and feedback could help to address some of these issues, but effective leadership could prevent the emergence of these problems.

The level of satisfaction among users was determined mainly by the process of care (attitude of providers, respect, support, comfort, cultural sensitivity, attention) and effective communication (perceived to empower users for decision-making and taking control of their own or their children's health condition) rather than the health outcome alone.

The shortage of well-trained healthcare providers, drugs and equipment in healthcare facilities is an important barrier. While CHWs were found to be effective in delivery of health services, particularly in LMICs, and could help address the problem of staff shortage through task shifting, training, supervision and regulation of CHWs could be an important challenge. Healthcare settings other than the hospitals and clinics, such as home-based or community-based care, were more acceptable to users and improved their level of satisfaction. It appears from the review that patients and carers perceived having greater comfort and confidence within a known environment than within hospitals and clinics. With regard to the process of care, in addition to the providers' attitude and behaviour, and the perception of QoC among users, the providers' attitude towards change in terms of adopting new strategies and guidelines is important. Furthermore, providers' competencies to build trust, comfort and patient-centredness are essential to improve QoC over and above their technical skills.

## DISCUSSION

The facilitators and barriers to improving QoC for pregnant women, newborns and children identified in this metareview can be grouped into the six strategic management domains of the WHO's framework (information, patient and population engagement, regulations and standard, leadership, organisational capacity and models of care). However, there is a need to focus on user-provider communication and satisfaction by incorporating 'communication' as a subdomain under 'information' and 'satisfaction' as a new domain. Information provided through effective communication was more likely to improve user knowledge, health literacy and involvement in shared decision-making, thus leading to improved 'patient and population engagement'. In Donabedian's concept of interpersonal care, communication is a major aspect that could directly influence QoC,<sup>9</sup> and in recent years, communication in healthcare, particularly between healthcare professionals and patients, has attracted an increasing amount of attention.<sup>30</sup> Besides user-provider communication, effective communication between healthcare providers and

among different levels of the health system could improve efficiency and effectiveness of care provision.<sup>100</sup>

'Satisfaction' of users and providers is another important quality management strategy that should be focused on.<sup>101 102</sup> User 'satisfaction' is important for 'patient and population engagement', and 'satisfaction' in turn was found to be influenced by 'patient and population engagement', adequate information, communication and 'organisational capacity'. Wilson and Goldsmith<sup>101</sup> defined QoC as "the sum of its four components: technical quality (measured by patients' health status improvement), resource consumption (measured by the costs of care), patient satisfaction (measured by patient perception of the subjective or interpersonal aspects of care), values (measured by the acceptability of any trade-offs that must be made among the three previous outcomes)." Pittrof *et al*<sup>102</sup> in their definition of QoC for maternal health stated that childbirth being a culturally and emotionally sensitive area, other aspects of care could be more important than the health outcomes. This conforms to the findings of the metareview which showed that providers' attitude, behaviour, sensitivity and attention are important priorities for QoC from the perspective of the users. However, there could be other factors that influence satisfaction and need to be understood.

Since the facilitators and barriers to improving QoC were in general common for pregnant women, newborns and children, the following interventions could facilitate improvement in QoC across these population groups:

1. Health systems should set minimum standards of communication between users and providers, and also among providers across the various levels of the healthcare system to improve effectiveness and efficiency of care provision.
2. Language barriers, especially among the migrant and minority population, could be addressed with the help of qualified interpreters. Where necessary, health systems should recruit and train a cadre of qualified interpreters with effective communication skills. This would be particularly important considering the inequities and disparities in care provision faced by certain sections of the population in all countries.
3. Training on communication skills should be incorporated as an integral part of health professionals' education. Regular training of providers could also be an effective means of addressing several issues related to healthcare provision through improving the technical and communication skills, competence, confidence, cultural sensitivity, attitude and behaviour of providers. However, it ought to be acknowledged that training without an enabling environment will not improve the overall health outcomes and QoC.
4. CHWs have proven to be effective in mobilising and engaging users and communities in several LMICs. It is important for health systems to train and retain this valuable resource.

5. Midwives were found to be a valuable resource in HICs, and services provided by them were as effective and acceptable as that provided by doctors. This resource should be utilised well in LMICs by building their capacity through training and supportive supervision.
6. Audit and feedback, and training of providers are important strategies to improve adherence to regulations and standards. However, efforts are required to address the implementation challenges and methodological issues of audit and feedback to achieve greater benefits.

A number of gaps in evidence to improve QoC were identified which could be addressed through further studies. There is a requirement for studies and interventions in LMICs to assess the information and communication needs of a population with varying socioeconomic and education levels. Technical support through 'decision support systems' improved provider satisfaction; thus, studies are required to assess the feasibility of implementing essential low-cost 'decision support systems' within the healthcare system. However, in general, there is a dearth of knowledge with regard to the facilitators and barriers related to providers' satisfaction. Understanding this is equally important because motivation and satisfaction among providers are known to influence the QoC provided by healthcare professionals. Furthermore, good-quality observational studies are required to measure the effectiveness of standard care practices and the barriers to implementing these in LMICs, and to understand the key leadership issues in QoC.

Common measurement tools for maternal, newborn and child healthcare can be developed to assess the facilitators and barriers to good-quality healthcare. There is an urgent need to develop specific tools to measure users' and providers' satisfaction, and to incorporate tools to assess users' and communities' perceptions related to QoC in the mechanisms of audit and feedback. It is important that lessons learnt through measuring QoC using such tools are used by healthcare providers, health system managers and policy makers to continuously monitor and improve care provision.

### Limitations

Although the included papers and extracted data were reviewed, discussed and finalised by all authors, we acknowledge the limitation of not having two researchers independently review and extract the data. Considering that the scope of a metareview is limited to gathering evidence from systematic reviews and meta-analyses, it is quite likely that we might have missed information on facilitators and barriers to improving QoC discussed in other types of studies and reports. For example, we did not find systematic reviews or meta-analyses dedicated to analysing measurement methods and tools to measure QoC. We acknowledge

that the quality of the methods used to measure QoC is as important as identifying the facilitators and barriers; however, no information could be found in the included systematic reviews. This suggests the requirement for a systematic review that synthesises the existing evidence in this area.

It is recognised that the process of interpreting evidence from the literature and using it to recommend priorities in practice and policy to improve QoC is complicated. There is neither a single definition of QoC and nor are there set criteria against which QoC could be measured. This metareview was conducted within these limitations. There could be many other unidentified priorities facilitators and barriers to improving QoC, particularly country-specific ones, but this metareview of systematic reviews could be considered to be the first step in exploring and compiling existing knowledge about the global situation. The facilitators and barriers identified could be considered as basic to health systems in all countries, although the weight given to the identified issues may vary. The barriers to good-quality healthcare are common for pregnant women, newborns and children; thus, interventions targeted to address them will have uniform beneficial effects on QoC for these population groups. Adopting the identified facilitators of good quality of healthcare would help countries strengthen their health systems and ensure high-quality care for all.

### Author affiliations

<sup>1</sup>National Perinatal Epidemiology Unit (NPEU), Nuffield Department of Population Health, University of Oxford, Oxford, Oxfordshire, UK

<sup>2</sup>Department of Maternal, Newborn, Child & Adolescent Health, World Health Organization, Geneva, Switzerland

**Contributors** MN developed the concept, conducted the literature searches, reviewed the papers, extracted and analysed the data and wrote the paper. All other authors developed the concept, reviewed the included and excluded papers and edited the paper.

**Funding** This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** MN was commissioned by the Department of Maternal, Newborn, Child & Adolescent Health, WHO, 1211 Geneva, Switzerland to write a report on the quality of care for maternal, newborn, child and adolescent health, of which this paper is a part. SY, TL, CB-P, KB, EMM and MM currently work for the WHO.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data sharing statement** Excel files of extracted data from the systematic reviews can be made available through email requests to the corresponding author.

**Open Access** This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 3.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/3.0/>

### REFERENCES

1. United Nations Children's Fund. *Levels & trends in child mortality: report 2011. Estimates developed by the UN Inter-agency Group*



- for *Child Mortality Estimation*. New York: United Nations Children's Fund, 2011.
2. The Maternal Mortality Estimation Inter-Agency Group (MMEIG). *Trends in maternal mortality: 1990 to 2010*. Geneva: World Health Organization, 2012.
  3. Rajaratnam JK, Marcus JR, Flaxman AD, *et al*. Neonatal, postneonatal, childhood, and under-5 mortality for 187 countries, 1970–2010: a systematic analysis of progress towards Millennium Development Goal 4. *Lancet* 2010;375:1988–2008.
  4. Hogan MC, Foreman KJ, Naghavi M, *et al*. Maternal mortality for 181 countries, 1980–2008: a systematic analysis of progress towards Millennium Development Goal 5. *Lancet* 2010;375:1609–23.
  5. World Health Organization. *World health statistics 2012*. Geneva, Switzerland: World Health Organization, 2012.
  6. Bullough C, Meda N, Makowiecka K, *et al*. REVIEW: current strategies for the reduction of maternal mortality. *BJOG* 2005;112:1180–8.
  7. Mathai M. To ensure maternal mortality is reduced, quality of care needs to be monitored and improved alongside increasing skilled delivery coverage rates. *BJOG* 2011;118:12–14.
  8. World Health Organization. *Quality of care: a process for making strategic choices in health systems*. Geneva, Switzerland: World Health Organization, 2006.
  9. Donabedian A. *Explorations in quality assessment and monitoring*. Ann Arbor: Health Administration Press, 1980.
  10. Whitlock EP, Lin JS, Chou R, *et al*. Using existing systematic reviews in complex systematic reviews. *Ann Intern Med* 2008;148:776–82.
  11. Shea B, Grimshaw J, Wells G, *et al*. Development of AMSTAR: a measurement tool to assess the methodological quality of systematic reviews. *BMC Med Res Methodol* 2007;7:10.
  12. Matheson SL, Shepherd AM, Laurens KR, *et al*. A systematic meta-review grading the evidence for non-genetic risk factors and putative antecedents of schizophrenia. *Schizophr Res* 2011;133:133–42.
  13. Savard L, Thompson D, Clark A. A meta-review of evidence on heart failure disease management programs: the challenges of describing and synthesizing evidence on complex interventions. *Trials* 2011;12:194.
  14. Shea BJ, Hamel C, Wells GA, *et al*. AMSTAR is a reliable and valid measurement tool to assess the methodological quality of systematic reviews. *J Clin Epidemiol* 2009;62:1013–20.
  15. Donabedian A. The quality of care. *JAMA* 1988;260:1743–8.
  16. Robinson N. The use of focus group methodology—with selected examples from sexual health research. *J Adv Nurs* 1999;29:905–13.
  17. Webb C, Kevern J. Focus groups as a research method: a critique of some aspects of their use in nursing research. *J Adv Nurs* 2001;33:798–805.
  18. Miles MB, Huberman AM. *Qualitative data analysis: an expanded sourcebook*. Sage Publications, Incorporated, 1994.
  19. Cohen E, Jovcevska V, Kuo DZ, *et al*. Hospital-based comprehensive care programs for children with special health care needs: a systematic review. *Arch Pediatr Adolesc Med* 2011;165:554–61.
  20. Chaillet N, Dube E, Dugas M, *et al*. Evidence-based strategies for implementing guidelines in obstetrics: a systematic review. *Obstet Gynecol* 2006;108:1234–45.
  21. Chaillet N, Dumont A. Evidence-based strategies for reducing cesarean section rates: a meta-analysis. *Birth* 2007;34:53–64.
  22. Dogba M, Fournier P. Human resources and the quality of emergency obstetric care in developing countries: a systematic review of the literature. *Hum Resour Health* 2009;7:7.
  23. Puia D. A meta-synthesis of women's experiences of cesarean birth. *MCN Am J Matern Child Nurs* 2013;38:41–7.
  24. Downe S, Finlayson K, Walsh D, *et al*. 'Weighing up and balancing out': a meta-synthesis of barriers to antenatal care for marginalised women in high-income countries. *BJOG* 2009;116:518–29.
  25. Almeida LM, Caldas J, Ayres-de-Campos D, *et al*. Maternal healthcare in migrants: a systematic review. *Matern Child Health J* 2013;17:1346–54.
  26. Kongnyuy EJ, Uthman OA. Use of criterion-based clinical audit to improve the quality of obstetric care: a systematic review. *Acta Obstet Gynecol Scand* 2009;88:873–81.
  27. Ibanez G, de Reynal de Saint Michel C, Denantes M, *et al*. Systematic review and meta-analysis of randomized controlled trials evaluating primary care-based interventions to promote breastfeeding in low-income women. *Fam Pract* 2012;29:245–54.
  28. Urquhart C, Currell R, Grant Maria J, *et al*. Nursing record systems: effects on nursing practice and healthcare outcomes. *Cochrane Database Syst Rev* 2009;(1):CD002099.
  29. Ngo-Metzger Q, Hayes GR, Yunan C, *et al*. Improving communication between patients and providers using health information technology and other quality improvement strategies: focus on low-income children. *Med Care Res Rev* 2010;67(5 Suppl):246S–67S.
  30. Rowe RE, Garcia J, Macfarlane AJ, *et al*. Improving communication between health professionals and women in maternity care: a structured review. *Health Expect* 2002;5:63–83.
  31. Tan K, Dear Peter RF, Newell Simon J. Clinical decision support systems for neonatal care. *Cochrane Database Syst Rev* 2005;(2):CD004211.
  32. Chapman SM, Grocott MP, Franck LS. Systematic review of paediatric alert criteria for identifying hospitalised children at risk of critical deterioration. *Intensive Care Med* 2010;36:600–11.
  33. van Rosse F, Maat B, Rademaker CM, *et al*. The effect of computerized physician order entry on medication prescription errors and clinical outcome in pediatric and intensive care: a systematic review. *Pediatrics* 2009;123:1184–90.
  34. Vodopivec-Jamsek V, de Jongh T, Gurol-Urganci I, *et al*. Mobile phone messaging for preventive health care. *Cochrane Database Syst Rev* 2012;(12):CD007457.
  35. Dean AJ, Walters J, Hall A. A systematic review of interventions to enhance medication adherence in children and adolescents with chronic illness. *Arch Dis Child* 2010;95:717–23.
  36. Ruiz-Mirazo E, Lopez-Yarto M, McDonald SD. Group prenatal care versus individual prenatal care: a systematic review and meta-analyses. *J Obstet Gynaecol Can* 2012;34:223–9.
  37. Linton JM, Feudtner C. What accounts for differences or disparities in pediatric palliative and end-of-life care? A systematic review focusing on possible multilevel mechanisms. *Pediatrics* 2008;122:574–82.
  38. Chen AY, Schragger SM, Mangione-Smith R. Quality measures for primary care of complex pediatric patients. *Pediatrics* 2012;129:433–45.
  39. Van Cleave J, Kuhlthau KA, Bloom S, *et al*. Interventions to improve screening and follow-up in primary care: a systematic review of the evidence. *Acad Pediatr* 2012;12:269–82.
  40. Nabhan Ashraf F, Faris Mohammed A. High feedback versus low feedback of prenatal ultrasound for reducing maternal anxiety and improving maternal health behaviour in pregnancy. *Cochrane Database Syst Rev* 2010;(4):CD007208.
  41. Horey D, Weaver J, Russell H. Information for pregnant women about caesarean birth. *Cochrane Database Syst Rev* 2004;(1):CD003858.
  42. Vlemmix F, Warendorf JK, Rosman AN, *et al*. Decision aids to improve informed decision-making in pregnancy care: a systematic review. *BJOG* 2013;120:257–66.
  43. Moineddin F, Moineddin R, Jadad AR, *et al*. Application of biomedical informatics to chronic pediatric diseases: a systematic review. *BMC Med Inform Decis Mak* 2009;9:22.
  44. Primack BA, Carroll MV, McNamara M, *et al*. Role of video games in improving health-related outcomes: a systematic review. *Am J Prev Med* 2012;42:630–8.
  45. Miltello LK, Kelly SA, Melnyk BM. Systematic review of text-messaging interventions to promote healthy behaviors in pediatric and adolescent populations: implications for clinical practice and research. *Worldviews Evid Based Nurs* 2012;9:66–77.
  46. Pyone T, Sorensen BL, Tellier S. Childbirth attendance strategies and their impact on maternal mortality and morbidity in low-income settings: a systematic review. *Acta Obstet Gynecol Scand* 2012;91:1029–37.
  47. Kiwanuka SN, Ekirapa EK, Peterson S, *et al*. Access to and utilisation of health services for the poor in Uganda: a systematic review of available evidence. *Trans R Soc Trop Med Hyg* 2008;102:1067–74.
  48. Herbert HK, Lee AC, Chandran A, *et al*. Care seeking for neonatal illness in low- and middle-income countries: a systematic review. *PLoS Med* 2012;9:e1001183.
  49. Blencowe H, Cousens S, Mullany LC, *et al*. Clean birth and postnatal care practices to reduce neonatal deaths from sepsis and tetanus: a systematic review and Delphi estimation of mortality effect. *BMC Public Health* 2011;11(Suppl 3):S11.
  50. Beach MC, Gary TL, Price EG, *et al*. Improving health care quality for racial/ethnic minorities: a systematic review of the best evidence regarding provider and organization interventions. *BMC Public Health* 2006;6:104.
  51. Amaral JFF, Victora CG. The effect of training in Integrated Management of Childhood Illness (IMCI) on the performance and healthcare quality of pediatric healthcare workers: a systematic review. *Rev Bras Saúde Materno Infant* 2008;8:151–62.

52. Simkhada B, Teijlingen ER, Porter M, *et al.* Factors affecting the utilization of antenatal care in developing countries: systematic review of the literature. *J Adv Nurs* 2008;61:244–60.
53. Foster M, Whitehead L, Maybee P. Parents' and health professionals' perceptions of family centred care for children in hospital, in developed and developing countries: a review of the literature. *Int J Nurs Stud* 2010;47:1184–93.
54. Kaye DA. *Women's perceptions of telephone nursing care within an antenatal home care program* [Msc]. Canada: University of Ottawa (Canada), 2007.
55. Brown Heather C, Smith Helen J. Giving women their own case notes to carry during pregnancy. *Cochrane Database Syst Rev* 2004;(2):CD002856.
56. Brown Heather C, Paranjothy S, Dowswell T, *et al.* Package of care for active management in labour for reducing caesarean section rates in low-risk women. *Cochrane Database Syst Rev* 2008;(4):CD004907.
57. Dowswell T, Carroli G, Duley L, *et al.* Alternative versus standard packages of antenatal care for low-risk pregnancy. *Cochrane Database Syst Rev* 2010;(10):CD000934.
58. Carroli G, Villar J, Piaggio G, *et al.* WHO systematic review of randomised controlled trials of routine antenatal care. *Lancet* 2001;357:1565–70.
59. Ngo TD, Park MH, Shakur H, *et al.* Comparative effectiveness, safety and acceptability of medical abortion at home and in a clinic: a systematic review. *Bull World Health Organ* 2011; 89:360–70.
60. Hatem M, Sandall J, Devane D, *et al.* Midwife-led versus other models of care for childbearing women. *Cochrane Database Syst Rev* 2009;(4):1–101.
61. Hodnett Ellen D, Downe S, Walsh D. Alternative versus conventional institutional settings for birth. *Cochrane Database Syst Rev* 2012;(8):CD000012.
62. Renner RM, Brahmī D, Kapp N. Who can provide effective and safe termination of pregnancy care? A systematic review. *BJOG* 2013;120:23–31.
63. Britton C, McCormick FM, Renfrew MJ, *et al.* Support for breastfeeding mothers. *Cochrane Database Syst Rev* 2007;(1):CD001141.
64. Hodnett Ellen D, Gates S, Hofmeyr GJ, *et al.* Continuous support for women during childbirth. *Cochrane Database Syst Rev* 2012;(10):CD003766.
65. Homer Caroline SE, Ryan C, Leap N, *et al.* Group versus conventional antenatal care for women. *Cochrane Database Syst Rev* 2012;(11):CD007622.
66. Villar J, Khan-Neelofur D. Patterns of routine antenatal care for low-risk pregnancy. *Cochrane Database Syst Rev* 2009;(2):CD000934.
67. Tan K, Lai Nai M. Telemedicine for the support of parents of high-risk newborn infants. *Cochrane Database Syst Rev* 2012;(6):CD006818.
68. Dowswell T, Kelly AJ, Livio S, *et al.* Different methods for the induction of labour in outpatient settings. *Cochrane Database Syst Rev* 2010;(8):CD007701.
69. Cooper C, Wheeler Danielle M, Woolfenden S, *et al.* Specialist home-based nursing services for children with acute and chronic illnesses. *Cochrane Database Syst Rev* 2006;(4):CD004383.
70. Mussman GM, Conway PH. Pediatric hospitalist systems versus traditional models of care: effect on quality and cost outcomes. *J Hosp Med* 2012;7:350–7.
71. Ogilvie D. Hospital based alternatives to acute paediatric admission: a systematic review. *Arch Dis Child* 2005;90:138–42.
72. Yakoob MY, Ali MA, Ali MU, *et al.* The effect of providing skilled birth attendance and emergency obstetric care in preventing stillbirths. *BMC Public Health* 2011;11:S7–14.
73. Beake S, Pellowe C, Dykes F, *et al.* A systematic review of structured compared with non-structured breastfeeding programmes to support the initiation and duration of exclusive and any breastfeeding in acute and primary health care settings. *Matern Child Nutr* 2012;8:141–61.
74. Moore Elizabeth R, Anderson Gene C, Bergman N, *et al.* Early skin-to-skin contact for mothers and their healthy newborn infants. *Cochrane Database Syst Rev* 2012;(5):CD003519.
75. Bhutta ZA, Ali S, Cousens S, *et al.* Alma-Ata: Rebirth and Revision 6 Interventions to address maternal, newborn, and child survival: what difference can integrated primary health care strategies make? *Lancet* 2008;372:972–89.
76. Pattinson R, Kerber K, Waiswa P, *et al.* Perinatal mortality audit: counting, accountability, and overcoming challenges in scaling up in low- and middle-income countries. *Int J Gynaecol Obstet* 2009;107:S113–22.
77. Pattinson Robert C, Say L, Makin JD, *et al.* Critical incident audit and feedback to improve perinatal and maternal mortality and morbidity. *Cochrane Database Syst Rev* 2005;(4):CD002961.
78. Pirkle CM, Dumont A, Zunzunegui M-V. Criterion-based clinical audit to assess quality of obstetrical care in low- and middle-income countries: a systematic review. *Int J Qual Health Care* 2011;23:456–63.
79. Bordley WC, Chelminski A, Margolis PA, *et al.* The effect of audit and feedback on immunization delivery: a systematic review. *Am J Prev Med* 2000;18:343–50.
80. Darmstadt GL, Lee AC, Cousens S, *et al.* 60 Million non-facility births: who can deliver in community settings to reduce intrapartum-related deaths? *Int J Gynaecol Obstet* 2009;107(Suppl 1):S89–112.
81. Walsh D, Downe SM. Outcomes of free-standing, midwife-led birth centers: a structured review. *Birth* 2004;31:222–9.
82. Wax JR, Lucas FL, Lamont M, *et al.* Maternal and newborn outcomes in planned home birth vs planned hospital births: a metaanalysis. *Am J Obstet Gynecol* 2010;203:243.e1–8.
83. Glenton C, Scheel IB, Lewin S, *et al.* Can lay health workers increase the uptake of childhood immunisation? Systematic review and typology. *Trop Med Int Health* 2011;16:1044–53.
84. Giugliani C, Harzheim E, Duncan MS, *et al.* Effectiveness of community health workers in Brazil: a systematic review. *J Ambul Care Manage* 2011;34:326–38.
85. Gogia S, Ramji S, Gupta P, *et al.* Community based newborn care: a systematic review and metaanalysis of evidence: UNICEF-PHFI series on newborn and child health, India. *Indian Pediatr* 2011;48:537–46.
86. Gogia S, Sachdev HS. Home visits by community health workers to prevent neonatal deaths in developing countries: a systematic review. *Bull World Health Organ* 2010;88:658–66b.
87. Hussein J, Kanguru L, Astin M, *et al.* The effectiveness of emergency obstetric referral interventions in developing country settings: a systematic review. *PLoS Med* 2012;9:e1001264.
88. Oyo-Ita A, Nwachukwu Chukwuemeka E, *et al.* Interventions for improving coverage of child immunization in low- and middle-income countries. *Cochrane Database Syst Rev* 2011;(7):CD008145.
89. Olsen O, Clausen Jette A. Planned hospital birth versus planned home birth. *Cochrane Database Syst Rev* 2012;(9):CD000352.
90. Lauzon L, Hodnett Ellen D. Labour assessment programs to delay admission to labour wards. *Cochrane Database Syst Rev* 2001;(3):CD000936.
91. Black RS, Brocklehurst P. A systematic review of training in acute obstetric emergencies. *BJOG* 2003;110:837–41.
92. Merien AE, van de Ven J, Mol BW, *et al.* Multidisciplinary team training in a simulation setting for acute obstetric emergencies: a systematic review. *Obstet Gynecol* 2010;115:1021–31.
93. Lassi Zohra S, Haider Batool A, Bhutta Zulfiqar A. Community-based intervention packages for reducing maternal and neonatal morbidity and mortality and improving neonatal outcomes. *Cochrane Database Syst Rev* 2010;(11):CD007754.
94. Opiyo N, English M. In-service training for health professionals to improve care of the seriously ill newborn or child in low and middle-income countries. *Cochrane Database Syst Rev* 2010;(4):CD007071.
95. Sibley Lynn M, Sipe Theresa A, Barry D. Traditional birth attendant training for improving health behaviours and pregnancy outcomes. *Cochrane Database Syst Rev* 2012;(8):CD005460.
96. Allen D, Gillen E, Rixson L. Systematic review of the effectiveness of integrated care pathways: what works, for whom, in which circumstances? *Int J Evid Based Healthc* 2009;7:61–74.
97. Butler M, Collins R, Drennan J, *et al.* Hospital nurse staffing models and patient and staff-related outcomes. *Cochrane Database Syst Rev* 2011;(7):CD007019.
98. Pate B. A systematic review of the effectiveness of breastfeeding intervention delivery methods (structured abstract). *J Obstet Gynecol Neonatal Nurs* 2009(6):642–53.
99. Naylor KT, Kingsnorth S, Lamont A, *et al.* The effectiveness of music in pediatric healthcare: a systematic review of randomized controlled trials. *Evid Based Complement Alternat Med* 2011;2011:464759, 18 pages.
100. Hulton LA, Matthews Z, Stones RW. Applying a framework for assessing the quality of maternal health services in urban India. *Soc Sci Med* 2007;64:2083–95.
101. Wilson L, Goldsmith P. Quality and its measurements. In: Wilson L, Goldsmith P, eds. *Quality management in health care*. Sydney, Australia: McGraw-Hill, 1995:229–58.
102. Pittrof R, Campbell OM, Filippi VG. What is quality in maternity care? An international perspective. *Acta Obstet Gynecol Scand* 2002;81:277–83.

103. Dennis CL, Kingston D. A systematic review of telephone support for women during pregnancy and the early postpartum period. *J Obstet Gynecol Neonatal Nurs* 2008;37:301–14.
104. Dzakpasu S, Powell-Jackson T, Campbell OM. Impact of user fees on maternal health service utilization and related health outcomes: a systematic review. *Health Policy Plan* 2013;7:7–18.
105. Lee AC, Lawn JE, Cousens S, *et al.* Linking families and facilities for care at birth: what works to avert intrapartum-related deaths? *Int J Gynaecol Obstet* 2009;107(Suppl 1):S65–85, S6–8.
106. Marston C, Renedo A, McGowan CR, *et al.* Effects of community participation on improving uptake of skilled care for maternal and newborn health: a systematic review. *PLoS ONE* 2013;8:e55012.
107. Haws RA, Thomas AL, Bhutta ZA, *et al.* Impact of packaged interventions on neonatal health: a review of the evidence. *Health Policy Plan* 2007;22:193–215.
108. Shields L, Zhou H, Pratt J, *et al.* Family-centred care for hospitalised children aged 0–12 years. *Cochrane Database Syst Rev* 2012;(10):CD004811.
109. Carfoot S, Williamson PR, Dickson R. A systematic review of randomised controlled trials evaluating the effect of mother/baby skin-to-skin care on successful breast feeding. *Midwifery* 2003;19:148–55.
110. van Lonkhuijzen L, Dijkman A, van Roosmalen J, *et al.* A systematic review of the effectiveness of training in emergency obstetric care in low-resource environments. *BJOG* 2010;117:777–87.
111. Schiffman J, Darmstadt GL, Agarwal S, *et al.* Community-based intervention packages for improving perinatal health in developing countries: a review of the evidence. *Semin Perinatol* 2010; 34:462–76.
112. Macy ML, Kim CS, Sasson C, *et al.* Pediatric observation units in the United States: a systematic review. *J Hosp Med* 2010; 5:172–82.
113. Miller MR, Robinson KA, Lubomski LH, *et al.* Medication errors in paediatric care: a systematic review of epidemiology and an evaluation of evidence supporting reduction strategy recommendations. *Qual Saf Health Care* 2007;16:116–26.