Lo birth eight, small-for-gestational age (SGA), pre-term birth, stillbirths, perinatal and neonatal mortalit are important ad erse outcomes of pregnanc [1]. The incidence of lo birth eight in de eloping countries aries from 6 - 30%, and at least one-third of these are small for gestational age, especiall in settings ith high rates of maternal undernutrition. Small for gestational age (SGA) babies are those hose birth eight lies belo the 10^{th} percentile for a particular gestational age [2]. Vast majorit of these are due to fetal gro th problems that occur during pregnanc , including intrauterine gro th restriction (IUGR) [3]. Full term SGA infants ma not ha e complications related to organ immaturit like

("Mothers"[Mesh] OR "Pregnanc "[Mesh] OR mother* OR maternal OR pregnanc) AND ("Micronutrients"[Mesh] OR "multiple micronutrient*" OR multi itamin OR micronutrient*) AND (supplement*)

Selection (inclusion/exclusion criteria)

All prospecti e randomi ed controlled trials (RCTs) e aluating multiple micronutrient supplementation in omen during pregnanc , irrespecti e of language or publication status, ere included. Multiple micronutrients ere defined as supplementation ith at least 5 micronutrients including the UNIMMAP formulation [13] or those ith comparable composition. These supplements ere compared to maternal iron-folate supplementation. There ere no limits on gestational age at the time of enrolment in the stud and the duration of supplementation. Quasi-randomi ed trials ere e cluded as there as an adequate number of good qualit RCTs a ailable. We did not conduct sub-group anal ses ith respect to different dosages of iron in the multiple micronutrient supplements. Other than the assessment of SGA and neonatal mortalit , e did not specificall e aluate minor ad erse effects of the supplements such as nausea and omiting among the mothers and ne borns.

Validity assessment

The o erall qualit of e idence of an outcome, ho e er, as assessed and graded according to the CHERG adaptation of the Grading of Recommendations Assessment, De elopment and E aluation (GRADE) technique [16,17] based on three components: 1) the olume and consistenc of the e idence; 2) the si e of the effect, or risk ratio; and 3) the strength of the statistical e idence for an association bet een the inter ention and outcome, as reflected b the p- alue [16]. The indi idual studies ere also graded. Three categories of criteria ere used to judge qualit of indi idual stud e idence in the meta-anal sis: 1) stud design; 2) stud qualit ; 3) rele ance to the objecti es of the re ie [16]. The follo ing four grades ere gi en to indi idual studies: high, moderate, lo or er lo . Stud recei ed an initial score of high if it as a randomi ed or cluster randomi ed trial. The grade as decreased b 0.5 to 1 for each stud design limitation. In addition, studies reporting an intent-to-treat anal sis or ith statisticall significant strong le els of association (>80% reduction) recei ed 0.5-1 grade increases. An stud ith a final grade of er lo as e cluded on the basis of inadequate stud qualit . This re ie is shaped in large part b the needs of the LiST model. In that model, increases in co erage of an inter ention result in a reduction of one or more cause-specific deaths or in reduction of a risk factor. Therefore, this re ie and the grade process used are designed to de elop estimates of the effect of an inter ention in reducing either a risk factor or a death due to specific cause. For more details of the re ie methods, the adapted grade approach or the LiST model, see the CHERG method's paper [16]. For the LiST tool, e ha e defined SGA as an outcome rather than lo birth eight as the model utili es the former for the cohort effect. The SGA babies, belonging to the least 10^{th} centile of the birth eight, ould be at a higher risk of mortalit and thus a greater effect of an inter ention. Besides, in se eral populations used in the studies, the t o terms ha e been used s non mousl .

Data abstraction and study characteristics

Each stud that satisfied the eligibilit criteria as included in the re ie . Data ere double abstracted into a standardi ed rectangular database [16] that as accessible through E cel (Additional File 1). Ke ariables like participants' characteristics, sample si e, location, setting, blinding, allocation concealment, description of inter ention and control groups (in terms of dosage and time of enrolment) and all the other outcomes of interest ere recorded.

Quantitative data synthesis

The assessment of statistical heterogeneit among trials as done b isual inspection i.e. the o erlap of the confidence inter als among the studies, and b the Chi square (P- alue) of heterogeneit in the meta-anal ses. A lo P alue (less than 0.10) or a large chi-squared statistic relati e to its degree of freedom as considered as pro iding e idence of heterogeneit . The I^2 alues ere also looked into, and roughl an I^2 greater than 50% as taken to represent substantial and high heterogene-

ere performed according to the mean maternal bod mass inde (BMI). In an effort to understand the conte t of neonatal outcomes, e e aluated the effect of multiple micronutrient supplements on neonatal mortalit b sub-group anal sis according to the percentage of facilit based deli eries. Not all studies pro ided sufficient data to allo categori ation of health s stem functionalit for maternal health, but information on facilit births or home births as a ailable. We used an arbitrar cut off of 60%, here more than 60% facilit births represented a pro for skilled attendance.

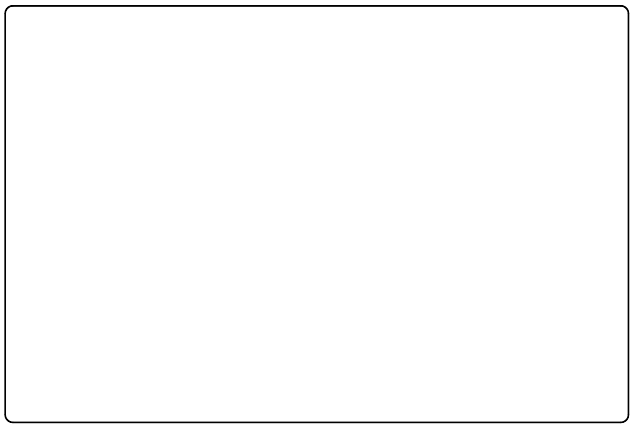
Trial flow

A total of 4,187 hits ere identified from our search strateg (Figure 1). After screening the titles and abstracts, 43 studies ere initiall considered eligible and finall , 17 studies comprising of 14 trials ere selected for inclusion in this re ie . We e aluated the impact of the inter ention on the follo ing outcomes: maternal anemia, SGA and neonatal and earl infant mortalit .

Study characteristics

The baseline characteristics of all the studies including

2 mg copper, 65 g selenium, 800 g RE itamin A, 1.4



6. Bac RE: t t . *B J* 2001, **85(2)**: S193-197.
7. H a SL, Ba e J, Sc a J, Ze e ER: **T f t t t / t f f t t . T e LINKAGES P ec**, Wa ; 1998.
8. **f 1993-2005. D t A** | *G a H a de Be B e a* 2008, (:// bd c. / b ca /2008/9789241596657_e d, acce ed 3 Febr a 2009).
9. C a P, O D, Ma a d a DS, K a SK, de LC AM, We KP J: **A t t t t t . *La*** 2005, **366(9487)**:711-712.
10. R a U, Mada N, A a a N, S a M, S d SK: **ff t f t f f t t . *I J a M.*** 1995, **38(3)**:273-279.
11. A e LH: **A f : ff t t .** *A J C* 2000, **71(5)**:1280S-1284S.
12. S RJ, M a L, Bac RE: **f** . | *C* [illegible] E a M, L e AD, R d e A, M a CLJ 2004:163-209.
13. UNICEF, WHO, UNU: **C t f t- t t t t t . Ne Y** : UNICEF; 1999.
14. Ha de BA, B a ZA: **t - t t t t f . C *D*** 2006, , **4:** CD004905.
15. **t t t t t t D D C t tt . t t 22.** UN S a d. C ee Ni ; N Da a, I Da -H , W Sc a , a d R S 2009, A a ab e a URL: :// c / e / b ca / Ä cce ed 09/08/2010.
16. Wa e N, F c e -Wa e C, B ce J, Ba R, C e S: **t f C f t t ff t . *I J E*** 2010, **39(1)**: 21-31.
17. A D, Be D, B PA, Ecce M, Fac -Y e Y, F S, G a GH, Ha b RT, Ha MC, He D, : **t f t t f t . *BMJ*** 2004, **328(7454)**:1490.
18. **C f t t**