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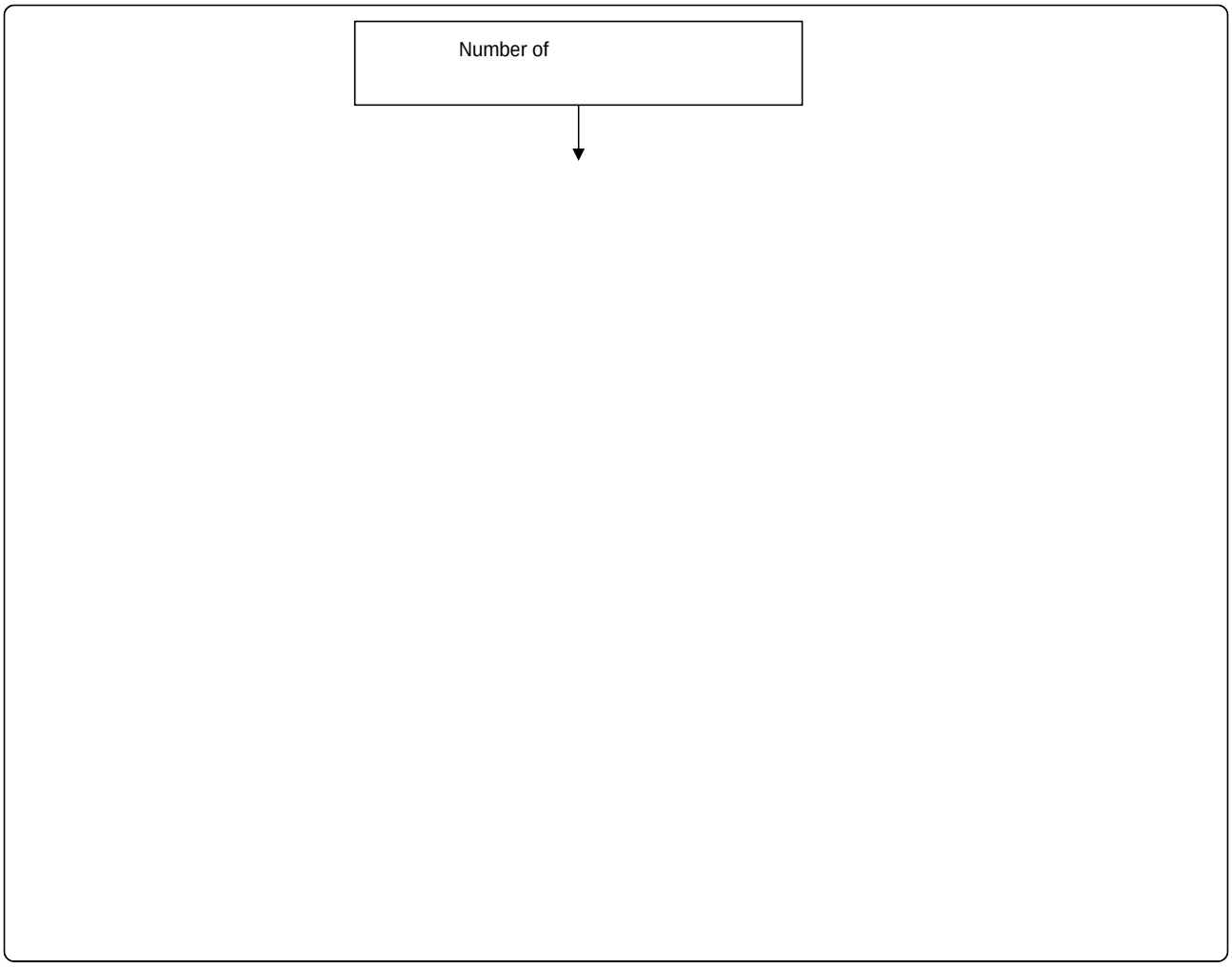

) (F 3A). T 9% (RR = 0.91; 95% CI: 0.76, 1.09) 30,31 IFA A CHERG , GRADE , 12 . A CHERG , 12 .

C 21,27,28,30,31,34 . A 15% (RR = 0.85; 95%: CI 0.65, 1.11) . F IFA 30,31 20% (RR = 0.80; 95% CI: 0.67, 0.96) (F 3B). I 21 10 A CHERG , 5 , M A 27 . T T 272 302 , 10% (RR = 0.90; 95% CI: 0.77, 1.06).

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Cause-specific morbidity impact estimation

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(RR = 0.81; 95%
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Outcome: All-cause mortality: Quality of evidence: Low						
7	RCTs	Sequence generation and allocation concealment was unclear in few of the included studies	I^2= 50%	Yes (all studies were conducted in developing countries)	The median dose of supplementation was 10 mg/day and median duration of supplementation was for 6 months.	0.91 (0.82-1.01)

18% (RR = 0.82; 95% CI: 0.64, 1.05) [illegible] I [illegible] 5 [illegible] H [illegible]

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9. Bates CJ, Evans PH, Dardenne M, Prentice A, Lunn PG, Northrop-Clewes CA, Hoare S, Cole TJ, Horan SJ, Longman SC, : A trial of zinc supplementation in young rural Gambian children. *B J N* 1993, 69(1):243-255.
10. Bhutta ZA, Black RE, Brown KH, Gardner JM, Gore S, Hidayat A, Khatun F, Martorell R, Ninh NX, Penny ME, : Prevention of diarrhea and pneumonia by zinc supplementation in children in developing countries: pooled analysis of randomized controlled trials. Zinc Investigators' Collaborative Group. *J P* 1999, 135(6):689-697.
11. Aggarwal R, Sentz J, Miller MA: Role of zinc administration in prevention of childhood diarrhea and respiratory illnesses: a meta-analysis. *P* 2007, 119(6):1120-1130.
12. Walker N, Fischer-Walker C, Bryce J, Bahl R, Cousens S: Standards for CHERG reviews of intervention effects on child survival. *I J E* 2010, 39(Suppl 1):i21-31.
13. Atkins D, Best D, Briss PA, Eccles M, Falck-Ytter Y, Flottorp S, Guyatt GH, Harbour RT, Haugh MC, Henry D, : Grading quality of evidence and strength of recommendations. *BMJ* 2004, 328(7454):1490.
14. RevMan: The Cochrane Colloboration. Review Manager (RevMan) 5 for Windows. Oxford England; 2003.
15. Richard SA, Zavaleta N, Caulfield LE, Black RE, Witzig RS, Shankar AH: Zinc and iron supplementation and malaria, diarrhea, and respiratory infections in children in the Peruvian Amazon. *A J M H* 2006, 75(1):126-132.
16. Gupta DN, Mondal SK, Ghosh S, Rajendran K, Sur D, Manna B: Impact of zinc supplementation on diarrhoeal morbidity in rural children of West Bengal, India. *A P* 2003, 92(5):531-536.
17. Muller O, Becher H, van Zweeden AB, Ye Y, Diallo DA, Konate AT, Gbangou A, Kouyate B, Garenne M: Effect of zinc supplementation on malaria and other causes of morbidity in west African children: randomised double blind placebo controlled trial. *BMJ* 2001, 322(7302):1567.
18. Osendarp SJ, Santosham M, Black RE, Wahed MA, van Raaij JM, Fuchs GJ: Effect of zinc supplementation between 1 and 6 mo of life on growth and morbidity of Bangladeshi infants in urban slums. *A J C N* 2002, 76(6):1401-1408.
19. Luabeya KK, Mpontshane N, Mackay M, Ward H, Elson I, Chhagan M, Tomkins A, van den Broeck J, Bennish ML: Zinc or multiple micronutrient supplementation to reduce diarrhea and respiratory disease in South african children: a randomized controlled trial. *PL ONE* 2007, 2(6):e541.
20. Bhandari N, Bahl R, Taneja S, Strand T, Molbak K, Ulvik RJ, Sommerfelt H, Bhan MK: Substantial reduction in severe diarrheal morbidity by daily zinc supplementation in young north Indian children. *P* 2002, 109(6):e86.
21. Brooks WA, Santosham M, Naheed A, Goswami D, Wahed MA, Diener-West M, Faruque AS, Black RE: Effect of weekly zinc supplements on incidence of pneumonia and diarrhoea in children younger than 2 years in an urban, low-income population in Bangladesh: randomised controlled trial. *L* 2005, 366(9490):999-1004.
22. Baqui AH, Zaman K, Persson LA, El Arifeen S, Yunus M, Begum N, Black RE: Simultaneous weekly supplementation of iron and zinc is associated with lower morbidity due to diarrhea and acute lower respiratory infection in Bangladeshi infants. *J N* 2003, 133(12):4150-4157.
23. Ninh NX, Thissen JP, Collette L, Gerard G, Khoi HH, Ketelslegers JM: Zinc supplementation increases growth and circulating insulin-like growth factor I (IGF-I) in growth-retarded Vietnamese children. *A J C N* 1996, 63(4):514-519.
24. Umeta M, West CE, Haidar J, Deurenberg P, Hautvast JG: Zinc supplementation and stunted infants in Ethiopia: a randomised controlled trial. *L* 2000, 355(9220):2021-2026.
25. Sazawal S, Black RE, Bhan MK, Jalla S, Sinha A, Bhandari N: Efficacy of zinc supplementation in reducing the incidence and prevalence of acute diarrhea–a community-based, double-blind, controlled trial. *A J C N* 1997, 66(2):413-418.
26. Shankar AH, Genton B, Baisor M, Paino J, Tamja S, Adiguma T, Wu L, Rare L, Bannon D, Tielsch JM, : The influence of zinc supplementation on morbidity due to Plasmodium falciparum: a randomized trial in preschool children in Papua New Guinea. *A J M H* 2000, 62(6):663-669.
27. Sazawal S, Black RE, Ramsan M, Chwaya HM, Dutta A, Dhingra U, Stoltzfus RJ, Othman MK, Kabole FM: Effect of zinc supplementation on mortality in children aged 1-48 months: a community-based randomised placebo-controlled trial. *L* 2007, 369(9565):927-934.
28. Bobat R, Coovadia H, Stephen C, Naidoo KL, McKerrow N, Black RE, Moss WJ: Safety and efficacy of zinc supplementation for children with HIV-1 infection in South Africa: a randomised double-blind placebo-controlled trial. *L* 2005, 366(9500):1862-1867.
29. Long KZ, Montoya Y, Hertzmark E, Santos JI, Rosado JL: A double-blind, randomized, clinical trial of the effect of vitamin A and zinc supplementation on diarrheal disease and respiratory tract infections in children in Mexico City, Mexico. *A J C N* 2006, 83(3):693-700.
30. Tielsch JM, Khatry SK, Stoltzfus RJ, Katz J, LeClerq SC, Adhikari R, Mullany LC, Shresta S, Black RE: Effect of routine prophylactic supplementation with iron and folic acid on preschool child mortality in southern Nepal: community-based, cluster-randomised, placebo-controlled trial. *L* 2006, 367(9505):144-152.
31. Bhandari N, Taneja S, Mazumder S, Bahl R, Fontaine O, Bhan MK: Adding zinc to supplemental iron and folic acid does not affect mortality and severe morbidity in young children. *J N* 2007, 137(1):112-117.
32. Penny ME, Marin RM, Duran A, Peerson JM, Lanata CF, Lonnerdal B, Black RE, Brown KH: Randomized controlled trial of the effect of daily supplementation with zinc or multiple micronutrients on the morbidity, growth, and micronutrient status of young Peruvian children. *A J C N* 2004, 79(3):457-465.
33. Bhandari N, Bahl R, Taneja S, Strand T, Molbak K, Ulvik RJ, Sommerfelt H, Bhan MK: Effect of routine zinc supplementation on pneumonia in children aged 6 months to 3 years: randomised controlled trial in an urban slum. *BMJ* 2002, 324(7350):1358.
34. Tielsch JM, Khatry SK, Stoltzfus RJ, Katz J, LeClerq SC, Adhikari R, Mullany LC, Black R, Shresta S: Effect of daily zinc supplementation on child mortality in southern Nepal: a community-based, cluster randomised, placebo-controlled trial. *L* 2007, 370(9594):1230-1239.
35. Sazawal S, Black RE, Ramsan M, Chwaya HM, Stoltzfus RJ, Dutta A, Dhingra U, Kabole I, Deb S, Othman MK, : Effects of routine prophylactic supplementation with iron and folic acid on admission to hospital and mortality in preschool children in a high malaria transmission setting: community-based, randomised, placebo-controlled trial. *L* 2006, 367(9505):133-143.
36. Sazawal S, Black RE, Menon VP, Dinghra P, Caulfield LE, Dhingra U, Bagati A: Zinc supplementation in infants born small for gestational age reduces mortality: a prospective, randomized, controlled trial. *P* 2001, 108(6):1280-1286.
37. Lira PI, Ashworth A, Morris SS: Effect of zinc supplementation on the morbidity, immune function, and growth of low-birth-weight, full-term infants in northeast Brazil. *A J C N* 1998, 68(2 Suppl):418S-424S.
38. Brown KH, Peerson JM, Baker SK, Hess SY: Preventive zinc supplementation among infants, preschoolers, and older prepubertal children. *F N B* 2009, 30(1 Suppl):S12-40.

doi:10.1186/1471-2458-11-S3-S23
C **:** Yakoob .: Preventive zinc supplementation in developing countries: impact on mortality and morbidity due to diarrhea, pneumonia and malaria. *BMC P H* 2011 11(Suppl 3): S23.