Appendices

KNOWLEDGE FOR
GLOBAL LIFESAVING SOLUTIONS

Memorandum

01 February 2011

To: Dr Md Anisur Rahman
Principal Investigator of research protocol # PR-10096
Public Health Sciences Division (PHSD)

From: Professor AKM Nurul Anwar
Chairman
Ethical Review Committee (ERC)

Sub: Approval of research protocol # PR-10096

Thank you for your memo dated 23 January 2011, requesting for expedited review and approval of your research protocol # PR-10096 entitled "**The Role of Intrapartum Complications on Stillbirth, Early Neonatal Death and Perinatal Mortality in Matlab, Bangladesh**" developed by Dr. Suchismita Roy, a PhD student in Epidemiology and Population Health, London School of Hygiene and Tropical Medicine, UK as part of his academic degree. Accordingly, the Committee approved the research protocol. I have pleasure to inform you that your above protocol is approved through expedited review mechanism. You will be required to observe the following terms and conditions in implementing the research protocol:

1. As Principal Investigator, the ultimate responsibility for scientific and ethical conduct including the protection of the rights and welfare of study participants vest upon you. You shall also be responsible for ensuring competence, integrity and ethical conduct of other investigators and staff directly involved in this research protocol.

2. You shall conduct the study in accordance with the ERC-approved protocol and shall fully comply with any subsequent determinations by the ERC.

3. You shall obtain prior approval from the Research Review Committee and the ERC for any modification in the approved research protocol and/or approved consent form(s), except in case of emergency to safeguard/eliminate apparent immediate hazards to study participants. Such changes must immediately be reported to the ERC Chairman.

4. You shall recruit/enroll participants for this study strictly adhering to the criteria mentioned in the research protocol.

5. You shall obtain legally effective informed consent (i.e. consent should be free from coercion or undue influence) from the selected study participants or their legally responsible representative, as approved in the protocol, using the

International Centre for Diarrhoeal Disease Research, Bangladesh
68, Shaheed Tajuddin Ahmed Sarani, Mohakhali, Dhaka 1212, Bangladesh
Mail : ICDDR,B, GPO Box 128, Dhaka1000, Bangladesh
Fax: 880-2-8823116,8812530,9885657,8811686,8812529,8826050,8811568
Phone : 880-2-8860523-32, Web : http://www.icddrb.org

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approved consent form prior to their enrollment in this study. Before obtaining consent, all prospective study participants must be adequately informed about the purpose(s) of the study, its methods and procedures, and also what would be done if they agree and also if they do not agree to participate in the study. They must be informed that their participation in the study is voluntary and that they can withdraw their participation any time without any prejudice. Signed consent forms should be preserved for a period of at least five years following official termination of the study.

6. You shall promptly report the occurrence of any Adverse Event or Serious Adverse Event or unanticipated problems of potential risk to study participants or others to the ERC in writing within 24 hours of such occurrences.

7. Any significant new findings, developing during the course of this study that might affect the risks and benefits and thus influence either participation in the study or continuation of participation should be reported in writing to the participants and the ERC.

8. Data and/or samples should be collected and interviews should be conducted, as specified in the ERC-approved protocol, and confidentiality must be maintained. Data/samples must be protected by reasonable security, safeguarding against risks such as their loss or unauthorized access, destructions, used by others, and modification or disclosure of data. Data/samples should not be disclosed, made available to or use for purposes other than those specified in the protocol, and shall be preserved for a period, as specified under Centre's policies/practices.

9. You shall promptly and fully comply with the decision of the ERC to suspend or withdraw its approval for the research protocol.

10. You shall report progress of research to the ERC for continuing review of the implementation of the research protocol as stipulated in the ERC Guidelines. Relevant excerpt of ERC Guidelines and '*Annual/Completion Report for Research Protocol involving Human Subjects*' are attached for your information and guidance.

I wish you success in running the above-mentioned study.

Copy: Acting Director, HSID
Coordination Manager, RA

Appendix I A (Chapter 3: Systematic Review)

Search strategy for systematic review (12th March 2012)

Database: Ovid MEDLINE(R)
Search Strategy:
---
1 Perinatal Mortality.mp. Or Perinatal Mortality/ (7278)
2 stillbirth.mp. or exp Stillbirth/ (4627)
3 fetal death.mp. or exp Fetal Death/ (24888)
4 infant mortality.mp. or exp Infant Mortality/ (25918)
5 pregnancy outcome.mp. or exp Pregnancy Outcome/ (37566)
6 (f?et* or perinat* or early neonat* or late neonat* or neonat* or newborn* or infant*).mp. (1333011)
7 (death* or mortalit* or fatalit* or (adverse adj3 outcome*) or (adverse adj3 event*) or wastage or loss*).mp.
(1355394)
8 5 and 7 (13034)
9 6 and 7 (176910)

10 Afghanistan.mp. or exp Afghanistan/ (2842)
11 Bangladesh.mp. or exp Bangladesh/ (7139)
12 exp Bhutan/ or Bhutan.mp. (232)
13 India.mp. or exp India/ (76045)
14 Maldives.mp. or exp Maldives/ (3505)
15 Nepal.mp. or exp Nepal/ (4764)
16 pakistan.mp. or Pakistan/ (10567)
17 Sri lanka.mp. or exp Sri Lanka/ (4508)
18 (South Asia or Subcontinent or sub-continent or Indian subcontinent or Indian sub-continent).mp. (2813)
19 1 or 2 or 3 or 4 or 8 or 9 (180615)
20 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 (106194)
21 19 and 20 (4635)
22 limit 21 to yr="1980-Current" **(4249)**

Database: Global Health
Search Strategy:
---
1 Perinatal Mortality.mp. or Perinatal Mortality/ (1691)
2 stillbirth.mp. or exp fetal death/ or fetal death.mp. (3412)
3 infant mortality.mp. or exp infant mortality/ (5905)
4 pregnancy outcome.mp. (1366)
5 (f?et* or perinat* or early neonat* or late neonat* or neonat* or newborn* or infant*).mp. (162270)
6 (death* or mortalit* or fatalit* or (adverse adj3 outcome*) or (adverse adj3 event*) or wastage or loss*).mp.
(257728)
7 4 and 6 (646)
8 5 and 6 (30648)
9 Afghanistan.mp. or exp Afghanistan/ (1266)
10 bangladesh.mp. or exp Bangladesh/ (6246)
11 Bhutan.mp. or exp Bhutan/ (199)
12 exp India/ or India.mp. (73103)
13 Nepal.mp. or exp Nepal/ (3427)
14 exp "North-West Frontier (Pakistan)"/ or exp "Punjab (Pakistan)"/ or exp "Federally Administered Tribal Areas(Pakistan)"/ or exp Pakistan/ or exp "Northern Areas (Pakistan)"/ or Pakistan.mp. (9277)
15 Sri lanka.mp. or exp Sri Lanka/ (4842)
16 Maldives.mp. or exp Maldives/ (145)

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17 (South Asia or Subcontinent or Indian subcontinent).mp. [mp=abstract, title, original title, broad terms, heading
words] (87798)
18 1 or 2 or 3 or 7 or 8 (31033)
19 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 (94310)
20 18 and 19 (2385)
21 limit 20 to yr="1980-Current" **(1711)**

Database: Embase
Search Strategy:
---
1 perinatal mortality.mp. or exp perinatal mortality/ (17223)
2 stillbirth.mp. or exp stillbirth/ (8619)
3 fetal death.mp. or exp fetus death/ (26662)
4 infant mortality.mp. or exp infant mortality/ (20746)
5 pregnancy outcome.mp. or exp pregnancy outcome/ (25374)
6 (f?et* or perinat* or early neonat* or late neonat* or neonat* or newborn* or infant*).mp. (1304873)
7 (death* or mortalit* or fatalit* or (adverse adj3 outcome*) or (adverse adj3 event*) or wastage or loss*).mp.(1872585)
8 5 and 7 (9698)
9 6 and 7 (201381)
10 Afghanistan.mp. or exp Afghanistan/ (3468)
11 Bangladesh.mp. or exp Bangladesh/ (8561)
12 Bhutan.mp. or exp Bhutan/ (262)
13 India.mp. or exp India/ (97974)
14 Maldives.mp. or exp Maldives/ (149)
15 Nepal.mp. or exp Nepal/ (5457)
16 Pakistan.mp. or exp Pakistan/ (14433)
17 Sri Lanka.mp. or exp Sri Lanka/ (5049)
18 exp South Asia/ or (South Asia or Subcontinent or sub-continent or Indian subcontinent or Indian
sub-continent).mp. (101241)
19 1 or 2 or 3 or 4 or 8 or 9 (207014)
20 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 (132782)
21 19 and 20 (4534)
22 limit 21 to (human and yr="1980 -Current") **(3729)**

Database: POPLINE
Search Strategy:

("Afghanistan"/"Bangladesh"/ "Bhutan"/"India"/"Maldives"/"Nepal"/"Pakistan"/"Sri Lanka"/"Asia, southern") & ((("Perinatal mortality"/"Stillbirth"/ "Fetal Death"/ "Infant Mortality"/ "Pregnancy Outcome"))/((fet*/ foet*/ perinat*/ early neonat*/ late neonat* /neonat* /newborn*/ infant*) &

(death*/ mortalit*/ fatalit*/adverse outcome*/ adverse event*/wastage/ loss*))) **(1342)**

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Studies:

Studies with stillbirth outcomes not reporting stillbirth definitions (24/57) are named below:

(Darmstadt et al., 2010, Sloan et al., 2008, Mercer et al., 2006b, Bari et al., 2002b),(Osendarp et al., 2000, Niswade et al., 2011, Tripathy et al., 2010), (Tielsch et al., 2009),(Benjamin et al., 2009),(Khatib et al., 2009) , (Bamji et al., 2008a),(Group, 2008), (Tielsch et al., 2007), (Singh and Arora, 2007), (Sinha, 2006),(von Ehrenstein et al., 2006), (Maskey et al., 2011), (Manandhar et al., 2010),(Bhutta et al., 2011),(Bhutta et al., 2009a),(Gustavson, 2005), (Gustavson, 2005), (Gustavson, 2005)

Gestational age cut-offs were specified for half of all studies (31/57) and only in 18 of 45 sub-national stillbirth studies are named below:

((Rahman et al., 2011a),(Rahman et al., 2010),(Azad et al., 2010b),(Baqui et al., 2008),(Ronsmans et al., 2008), (Subramoney et al., 2010), (George et al., 2009), (More et al., 2009), (Kumar et al., 2008), (Baqui et al., 2006b), (Nath et al., 2004), (Bang et al., 2002) , (Lee et al., 2011), (Lee et al., 2009), (Katz et al., 2008), (Manandhar et al., 2004b) ,(Christian et al., 2003), (Jokhio et al., 2005).

Sub-national studies with early neonatal death outcomes defining early neonatal deaths as deaths within seven days of birth (16/25) are named below:

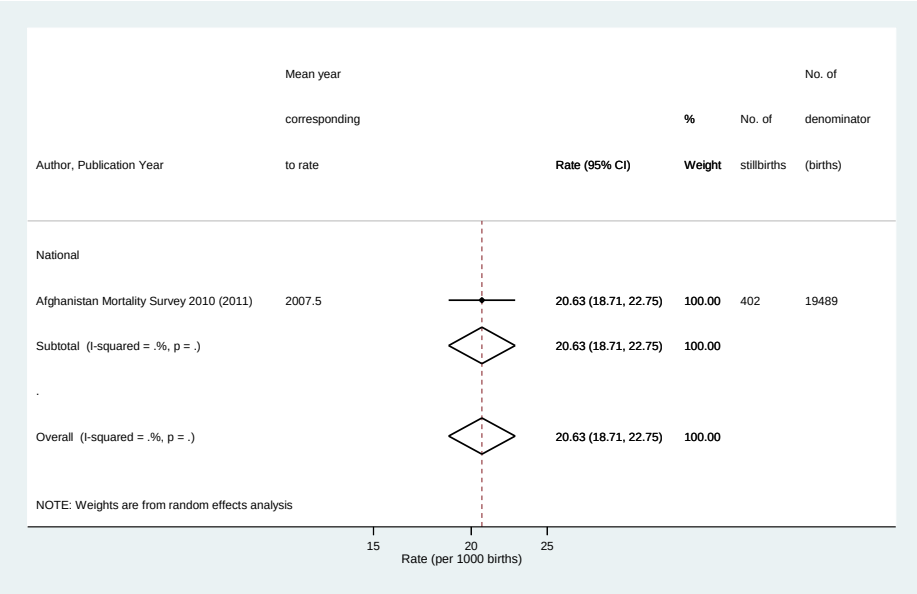
(Rahman et al., 2011a),(Sloan et al., 2008, Ronsmans et al., 2008, Bari et al., 2002b, Kumar et al., 2008, Group, 2008, Bang et al., 2002, Baqui et al., 2006a, Sinha, 2006) (Lee et al., 2011, Manandhar et al., 2004a, Christian et al., 2003, Katz et al., 2003, Jehan et al., 2009, Bhutta et al., 2009b) (Azad et al. 2010)

Studies (8/16) defining the late neonatal time period as 8-28 days after birth are named below:

(Sloan et al., 2008, Ronsmans et al., 2008, Katz et al., 2003, Bhutta et al., 2011, Jehan et al., 2009, Bhutta et al., 2009a) (Bang et al. 2001; Baqui et al. 2006).

Appendix I B (Chapter 3: Systematic Review)

Stillbirth Rates



sub-national studies).

Figure 2. Forest plot showing stillbirth rates in eligible studies from Bangladesh according to coverage of study (sub-national vs. national)

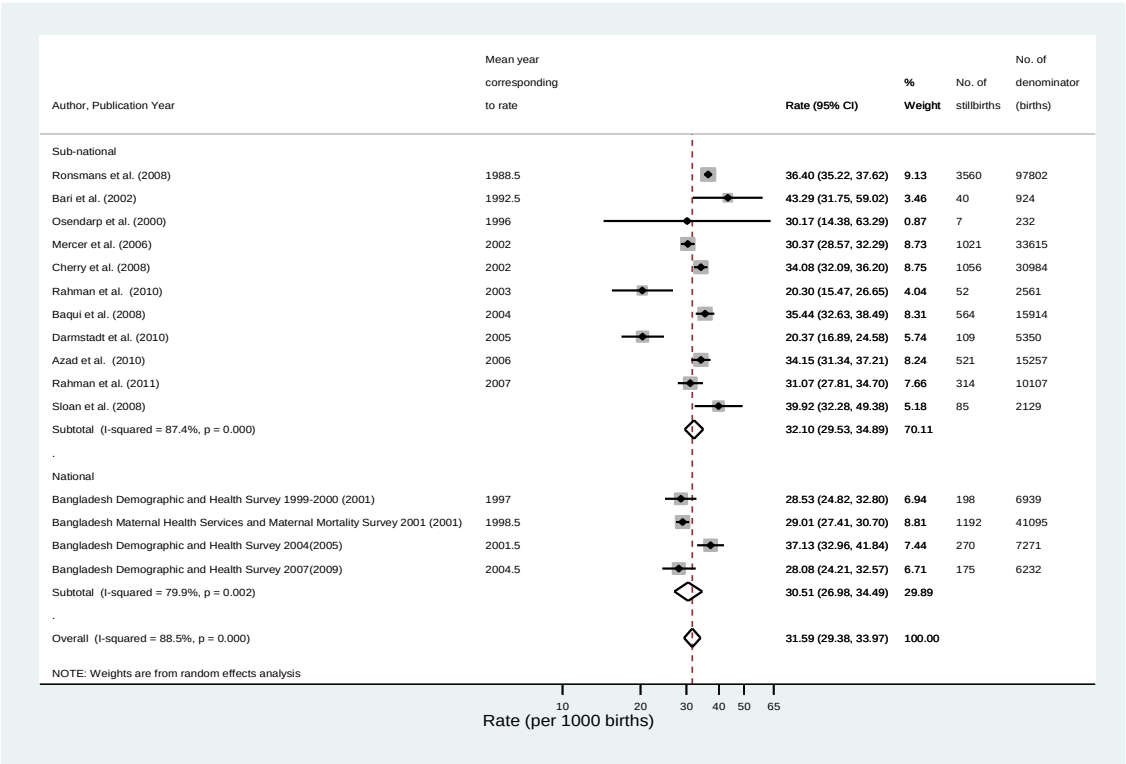


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Figure 2. Forest plot showing stillbirth rates in eligible studies from Bangladesh according to coverage of study (sub-national vs. national)

Figure 3. Forest plot showing stillbirth rates in eligible studies from India according to coverage of study (sub-national vs. national)

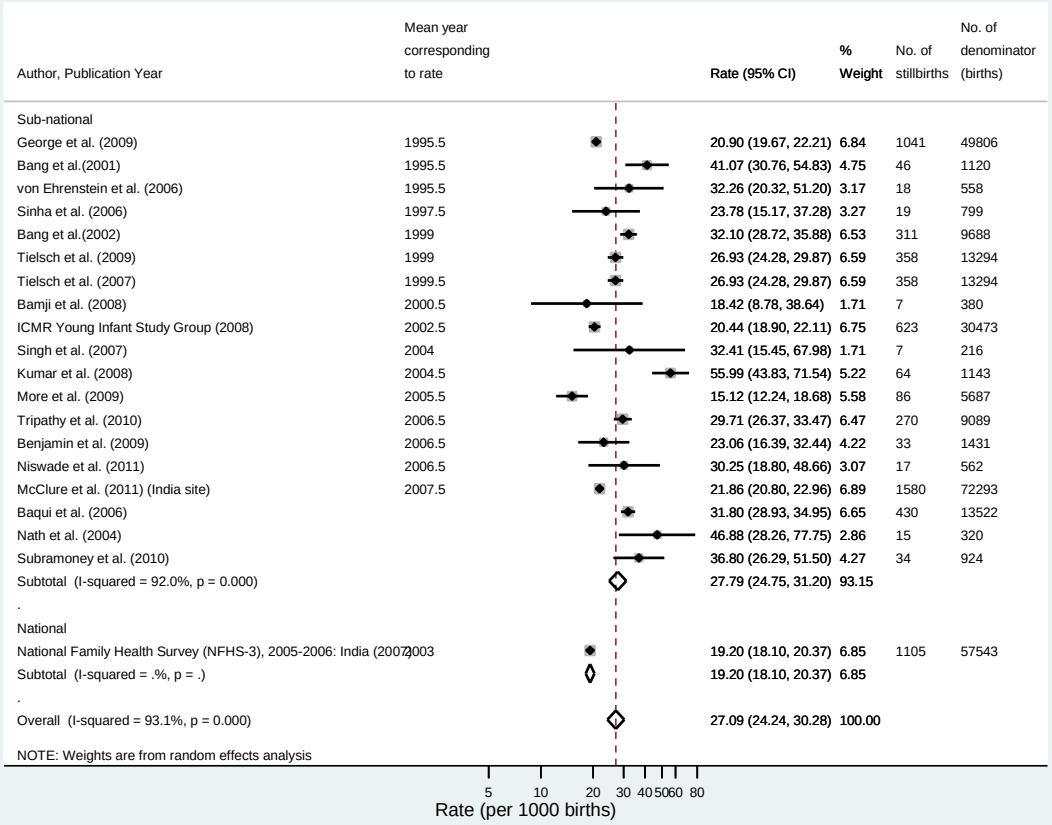

Figure 3. Forest plot showing stillbirth rates in eligible studies from India according to coverage of study (sub-national vs. national)

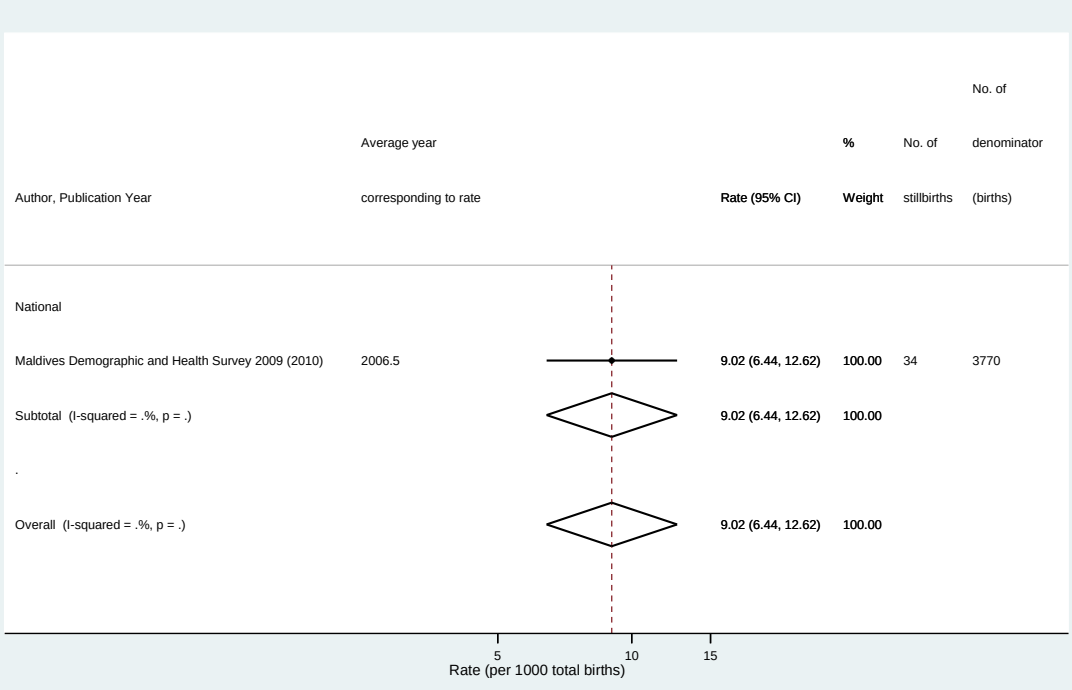

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Figure 4. National level estimate for the stillbirth rate in Maldives (There were no eligible sub-national studies)

Figure 5. Forest plot showing stillbirth rates in eligible studies from Nepal according to coverage of study (sub-national vs. national)

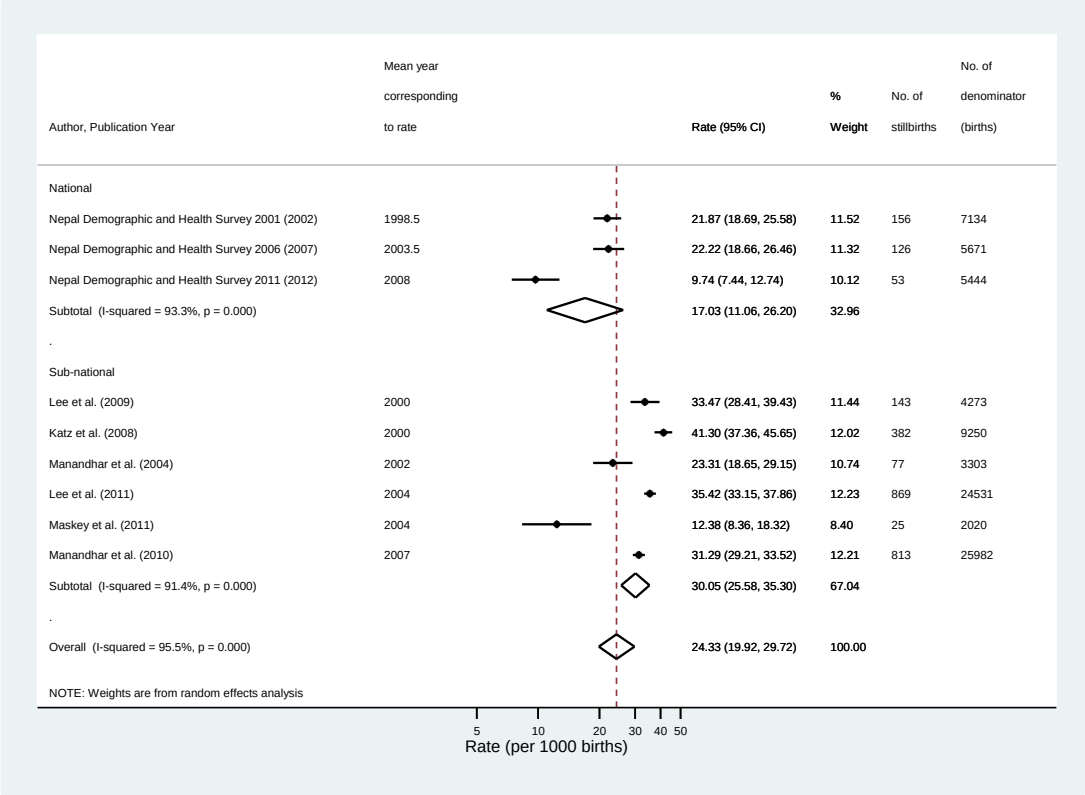

Figure 5. Forest plot showing stillbirth rates in eligible studies from Nepal according to coverage of study (sub-national vs. national)

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Figure 6. Forest plot showing stillbirth rates in eligible studies from Pakistan according to coverage of study (sub-national vs. national)

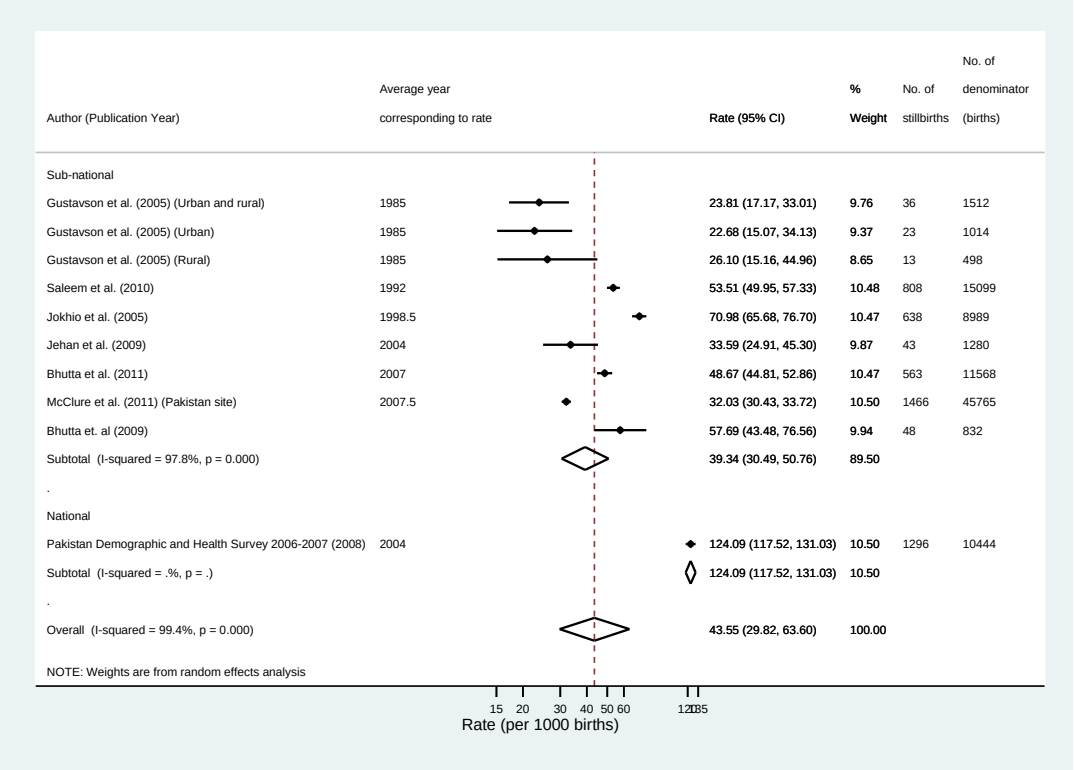

Figure 6. Forest plot showing stillbirth rates in eligible studies from Pakistan according to coverage of study (sub-national vs. national)

Figure 7. Forest plot showing stillbirth rates in eligible studies from Sri Lanka according to coverage of study (sub-national vs. national)

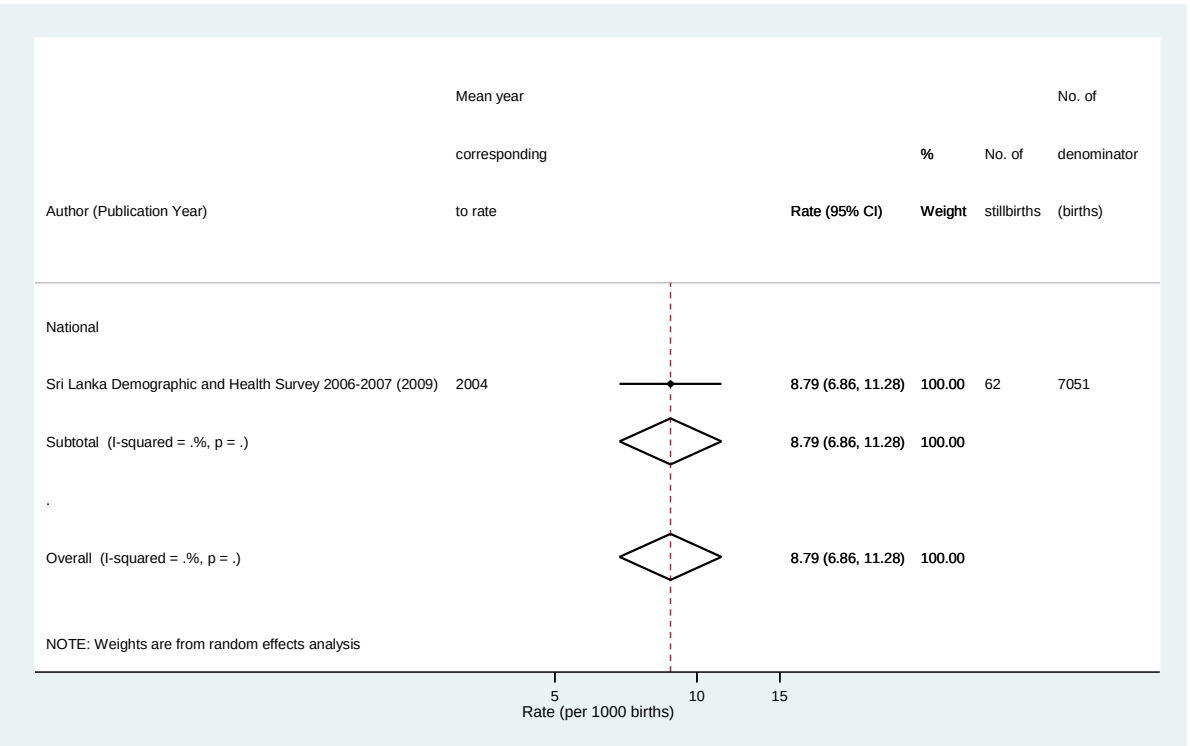

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Figure 7. Forest plot showing stillbirth rates in eligible studies from Sri Lanka according to coverage of study (sub-national vs. national)

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Early neonatal death rates:
The summary rates for early neonatal deaths are shown in Figures 8-14.

Figure 8. National level estimate for the early neonatal death rate in Afghanistan (There were no eligible sub-national studies)

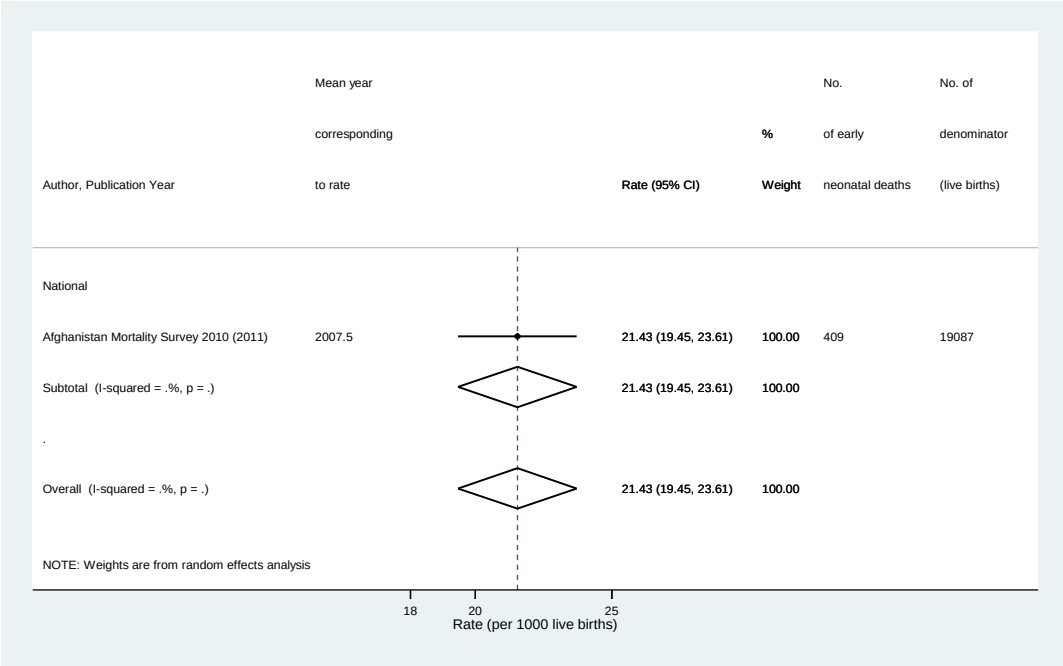


Figure 8. National level estimate for the early neonatal death rate in Afghanistan (There were no eligible sub-national studies)

Figure 9. Forest plot showing early neonatal death rates in eligible studies from Bangladesh according to coverage of study (sub-national vs. national)

Appendix I

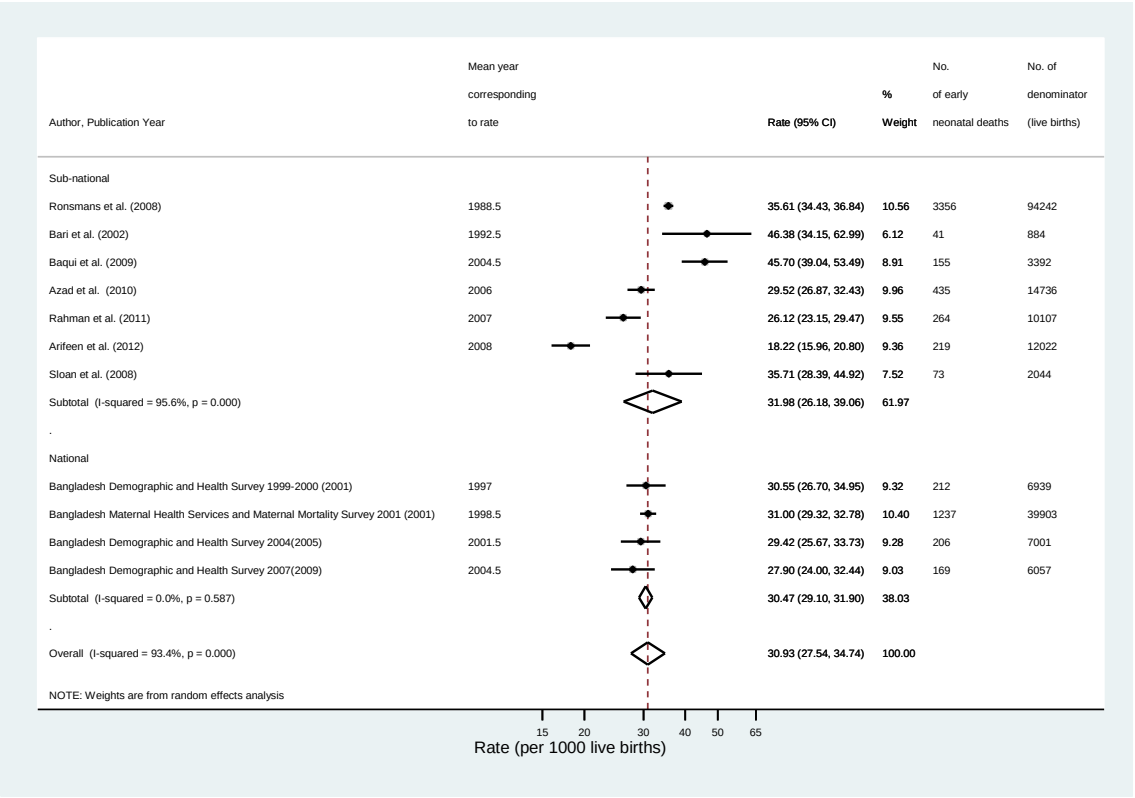
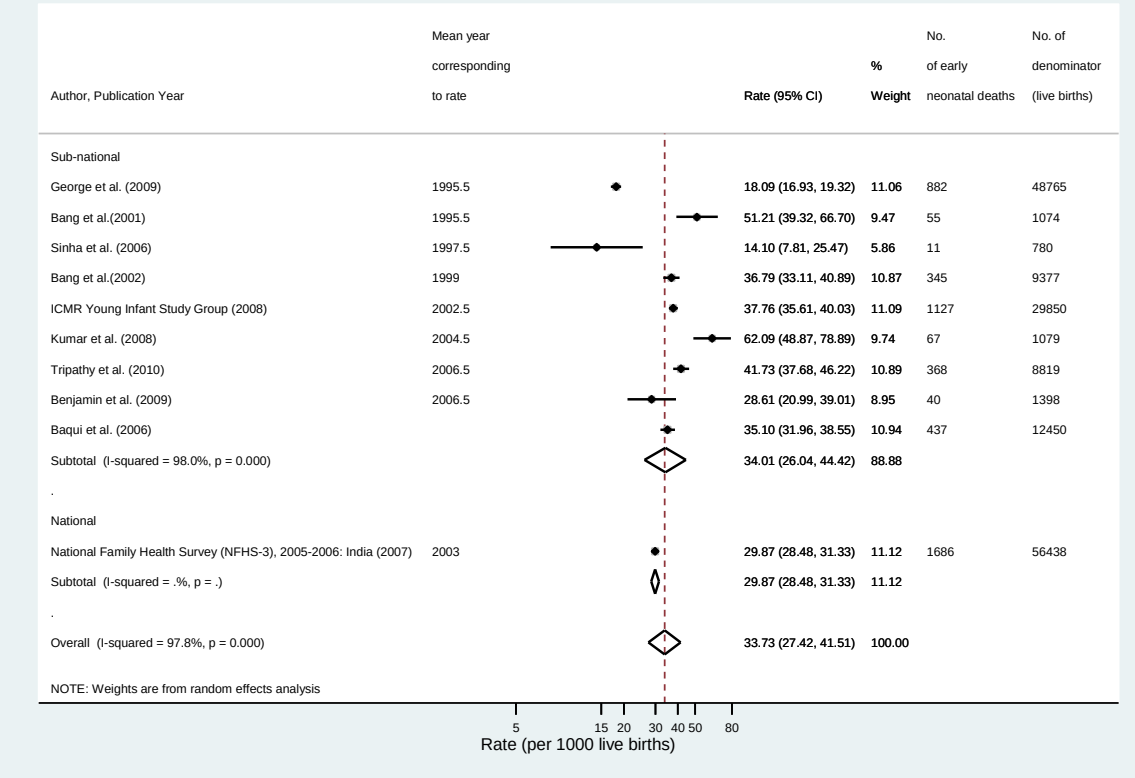


Figure 9. Forest plot showing early neonatal death rates in eligible studies from Bangladesh according to coverage of study (sub-national vs. national)

Figure 10. Forest plot showing early neonatal death rates in eligible studies from India according to coverage of study (sub-national vs. national)



Appendix I

Figure 10. Forest plot showing early neonatal death rates in eligible studies from India according to coverage of study (sub-national vs. national)

Figure 11. National level estimate for the early neonatal death rate in Maldives (There were no eligible sub-national studies)

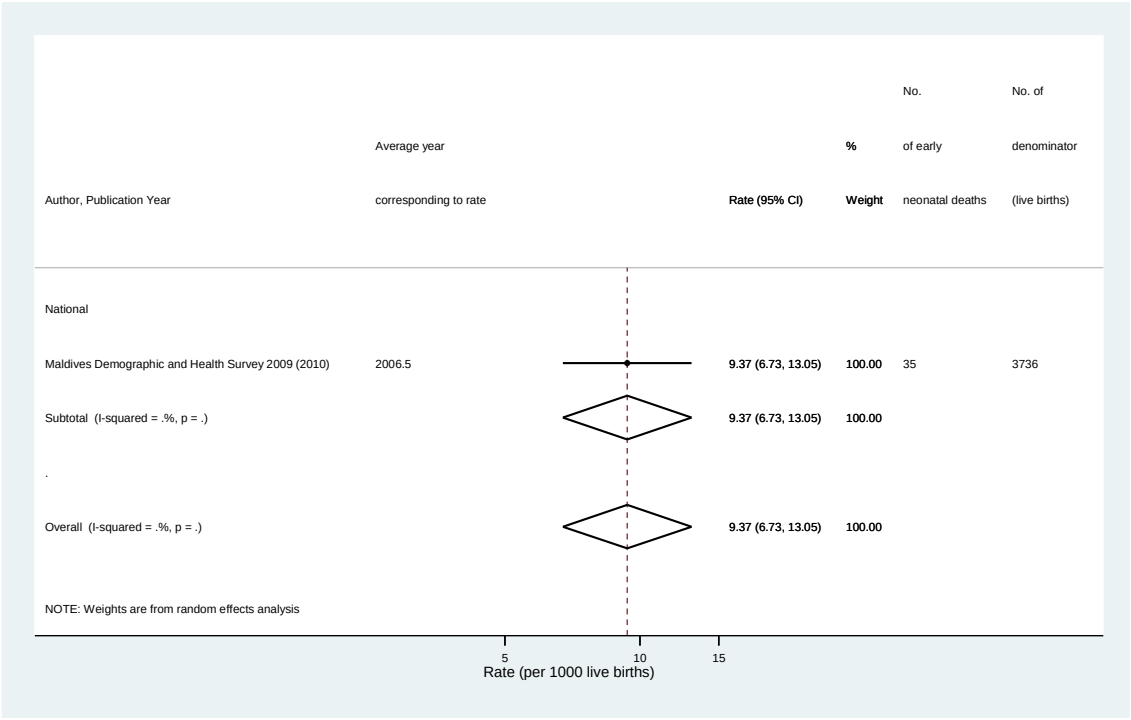


Figure 11. National level estimate for the early neonatal death rate in Maldives (There were no eligible sub-national studies)

Appendix I

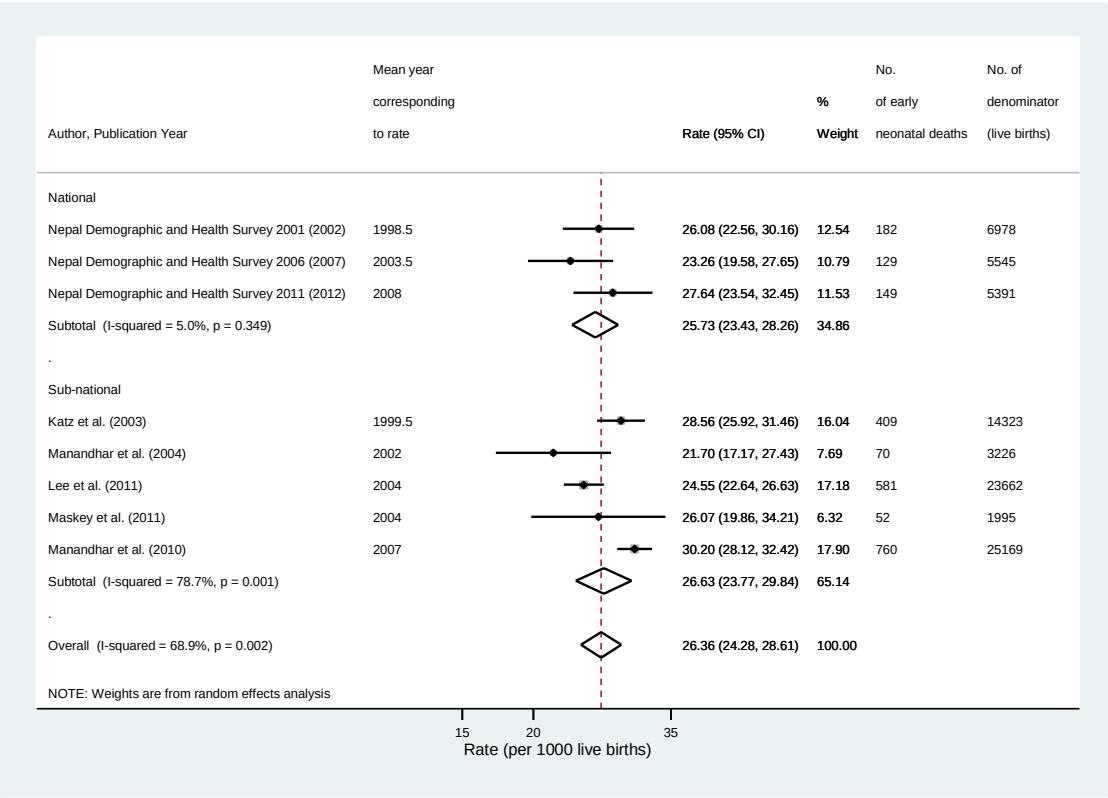


Figure 12. Forest plot showing early neonatal death rates in eligible studies from Nepal according to coverage of study (sub-national vs. national)

Figure 13. Forest plot showing early neonatal death rates in eligible studies from Pakistan according to coverage of study (sub-national vs. national)

Appendix I

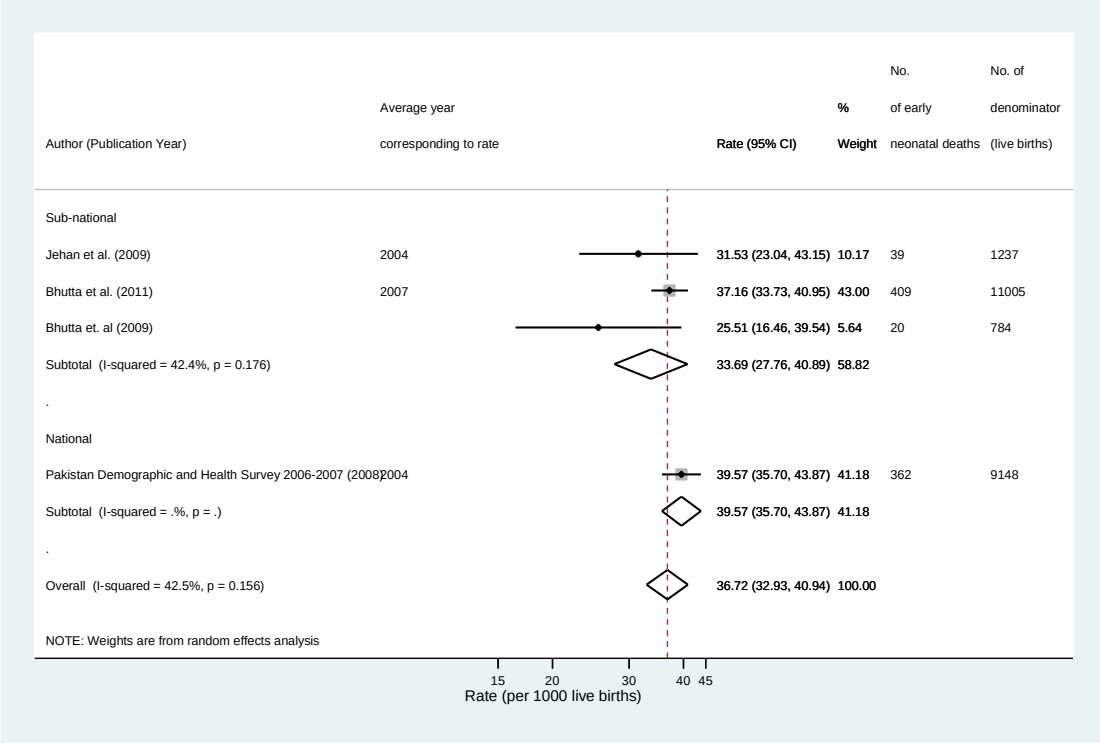
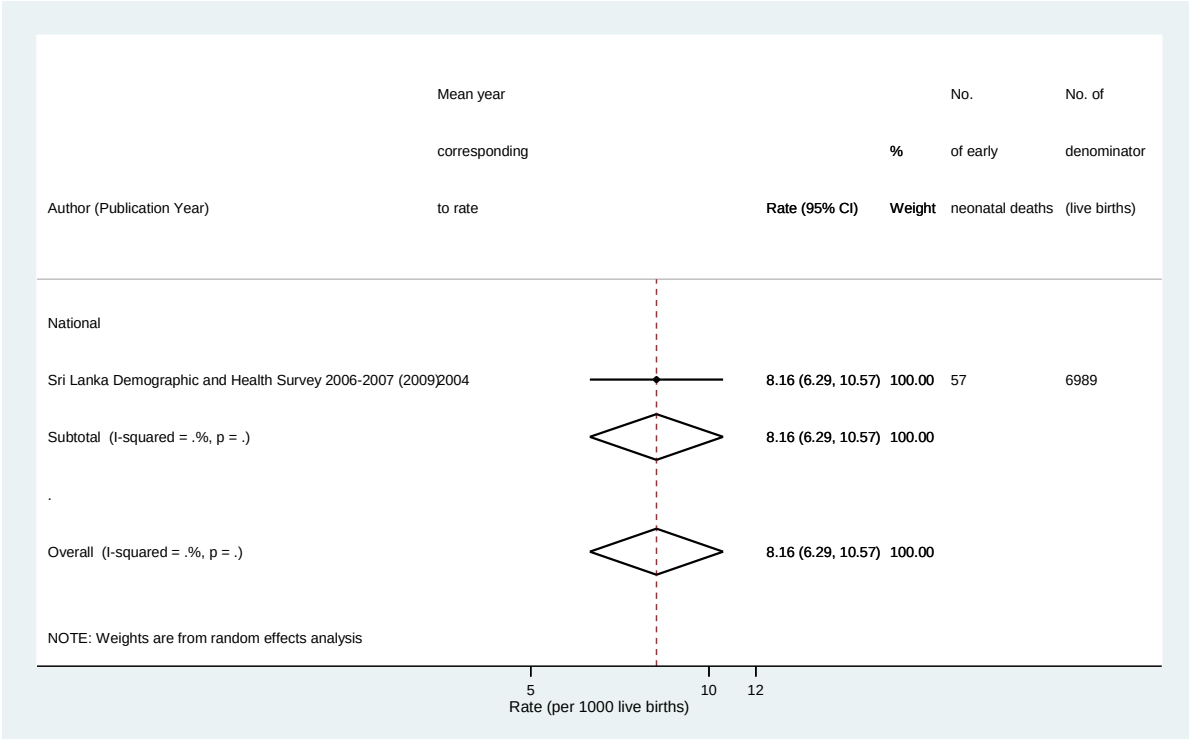


Figure 13. Forest plot showing early neonatal death rates in eligible studies from Pakistan according to coverage of study (sub-national vs. national)



Appendix I

Appendix I

Late neonatal death rates:

The summary rates for late neonatal deaths are shown in Figures 15-21

Figure 15. Forest plot showing late neonatal death rates in eligible studies from Afghanistan (There were no eligible sub-national studies).

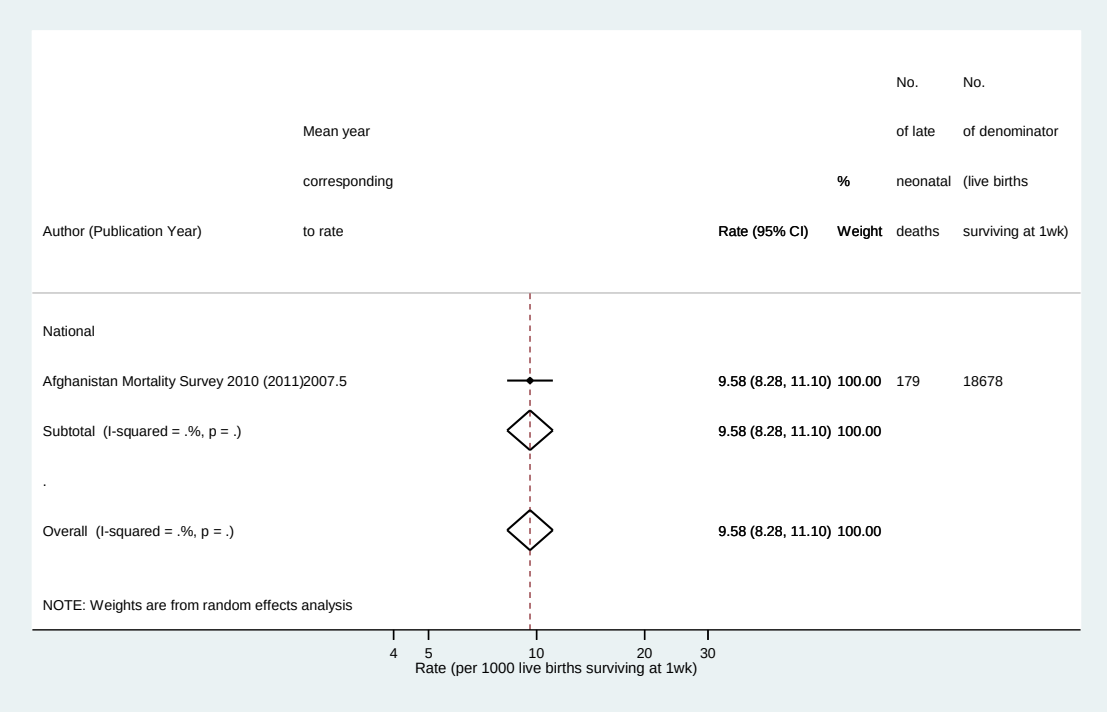


Figure 15. Forest plot showing late neonatal death rates in eligible studies from Afghanistan (There were no eligible sub-national studies).

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Figure 16. Forest plot showing late neonatal death rates in eligible studies from Bangladesh

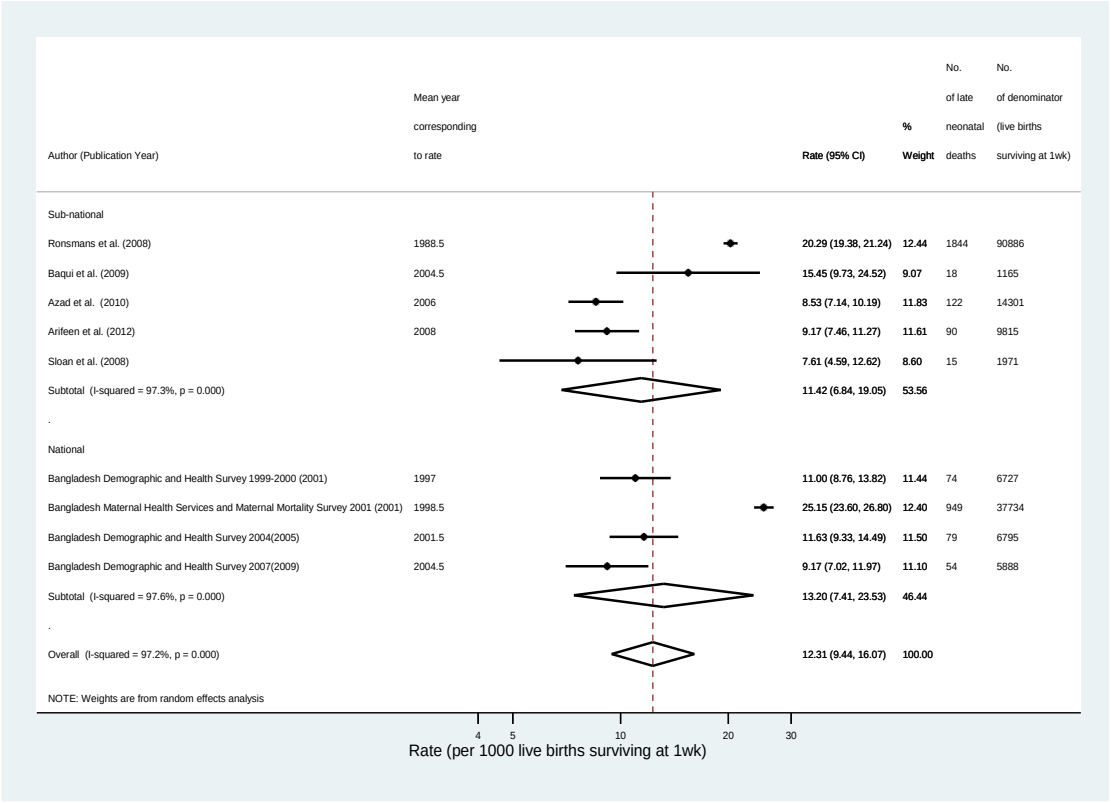

Figure 16. Forest plot showing late neonatal death rates in eligible studies from Bangladesh
Figure 17. Forest plot showing late neonatal death rates in eligible studies from India

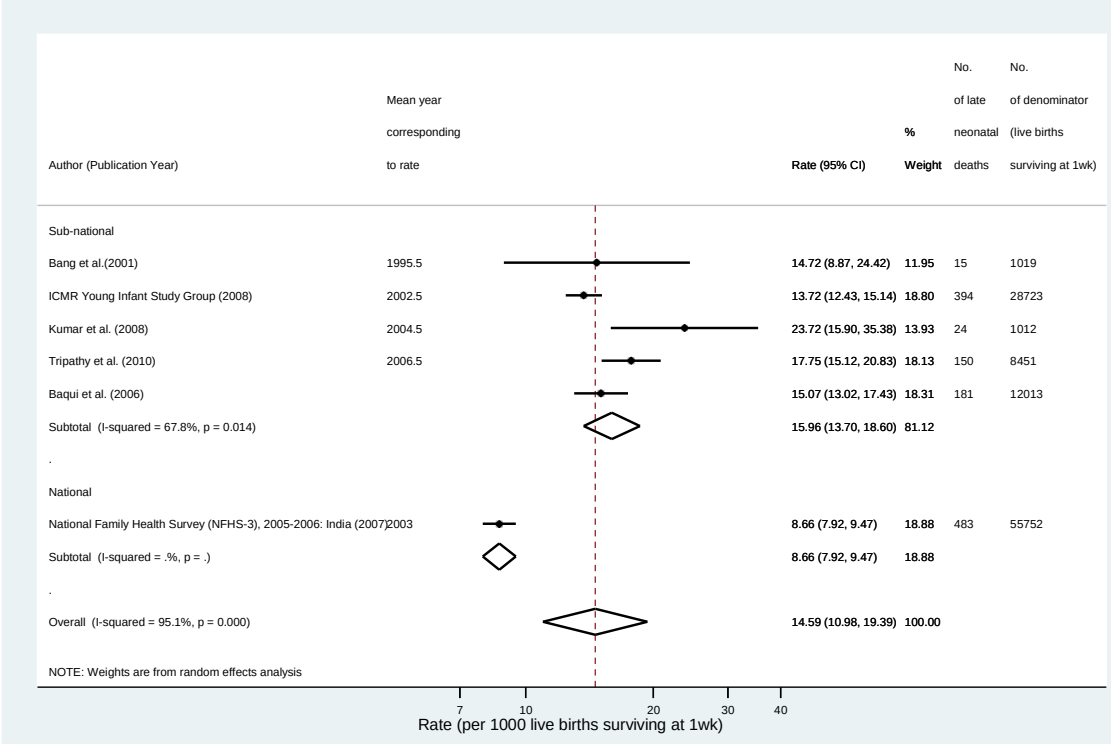

Figure 17. Forest plot showing late neonatal death rates in eligible studies from India

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Figure 18. Forest plot showing late neonatal death rates in eligible studies from Maldives(There were no eligible sub-national studies).

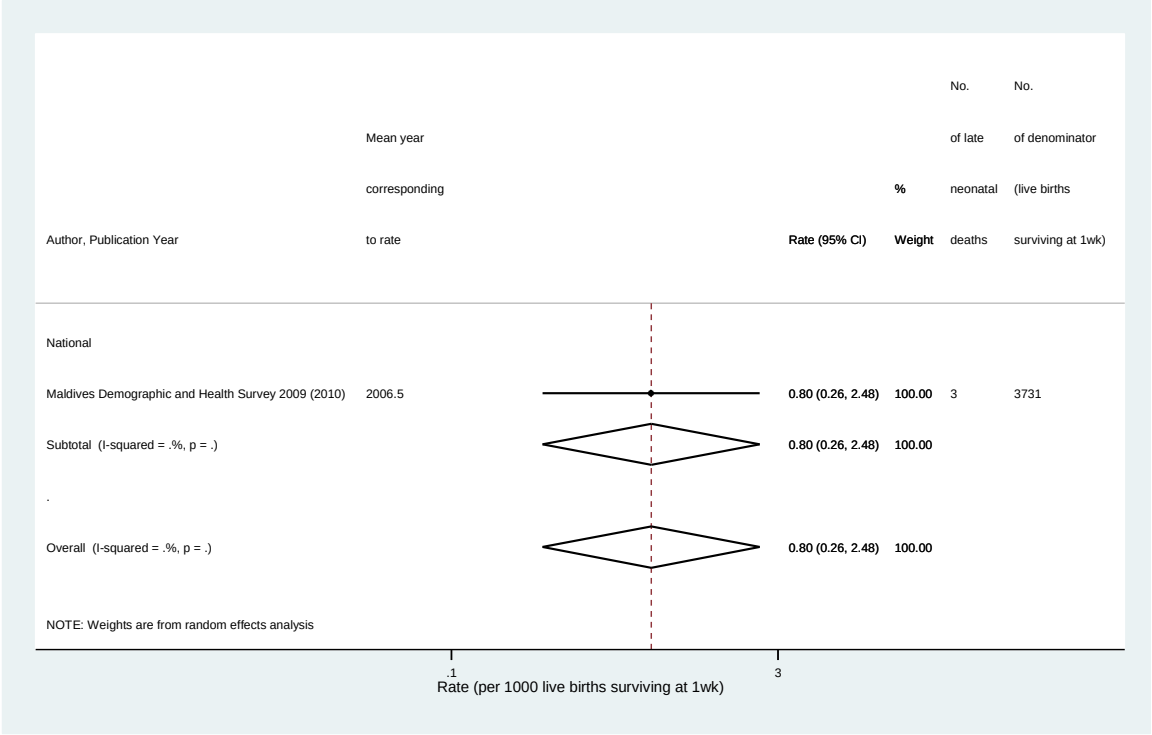

Figure 18. Forest plot showing late neonatal death rates in eligible studies from Maldives(There were no eligible sub-national studies).

Figure 19. Forest plot showing late neonatal death rates in eligible studies from Nepal

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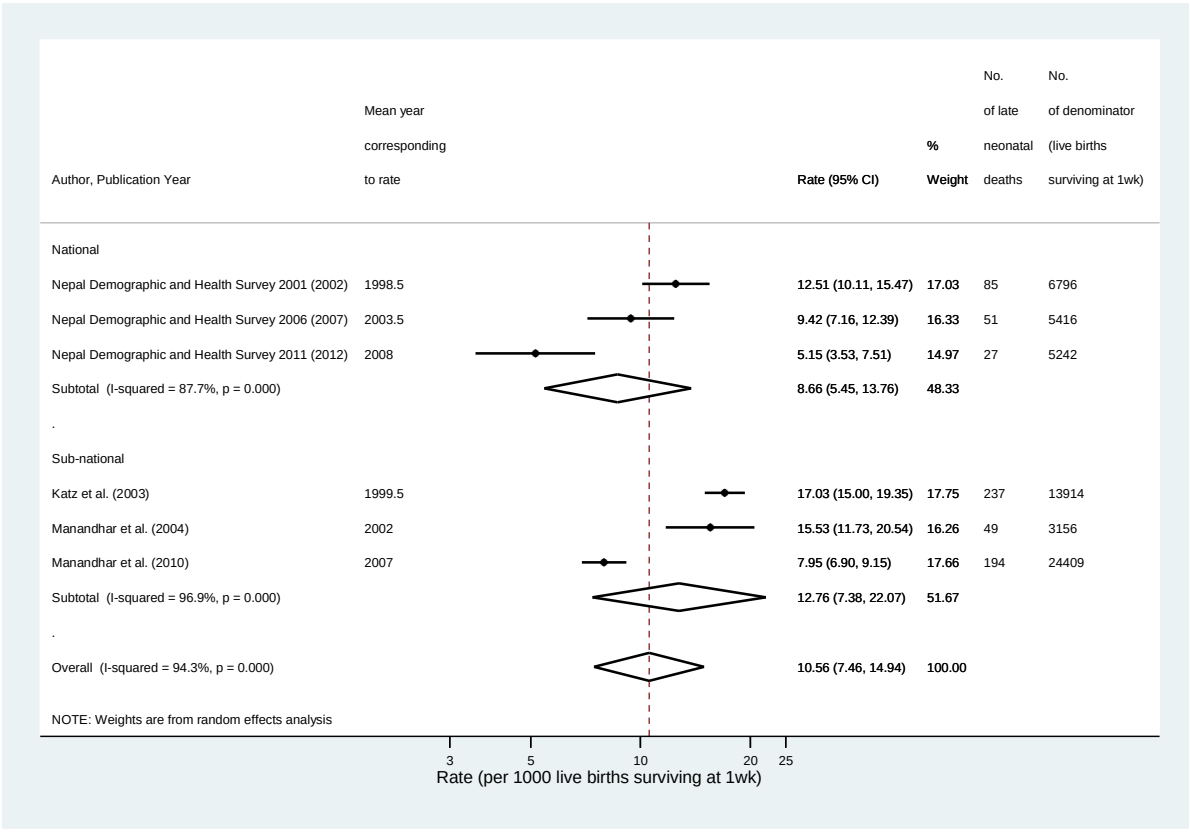

Figure 19. Forest plot showing late neonatal death rates in eligible studies from Nepal

Figure 20. Forest plot showing late

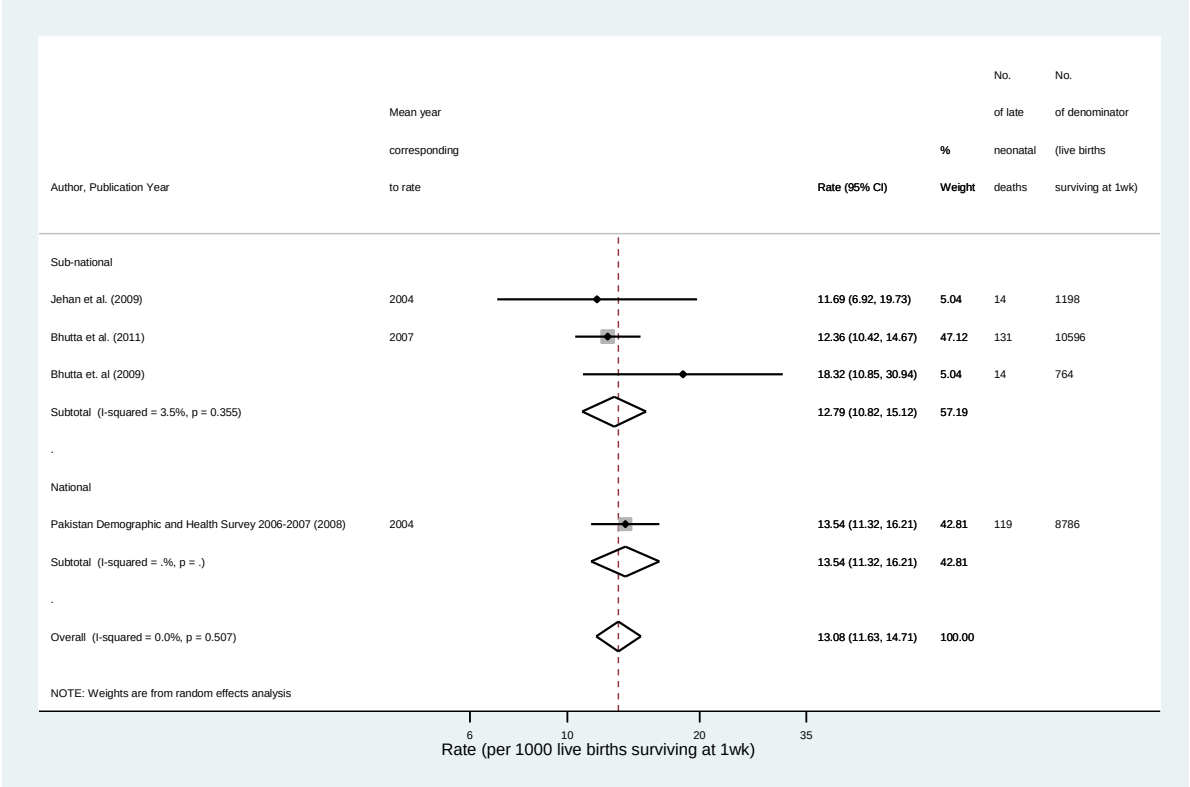

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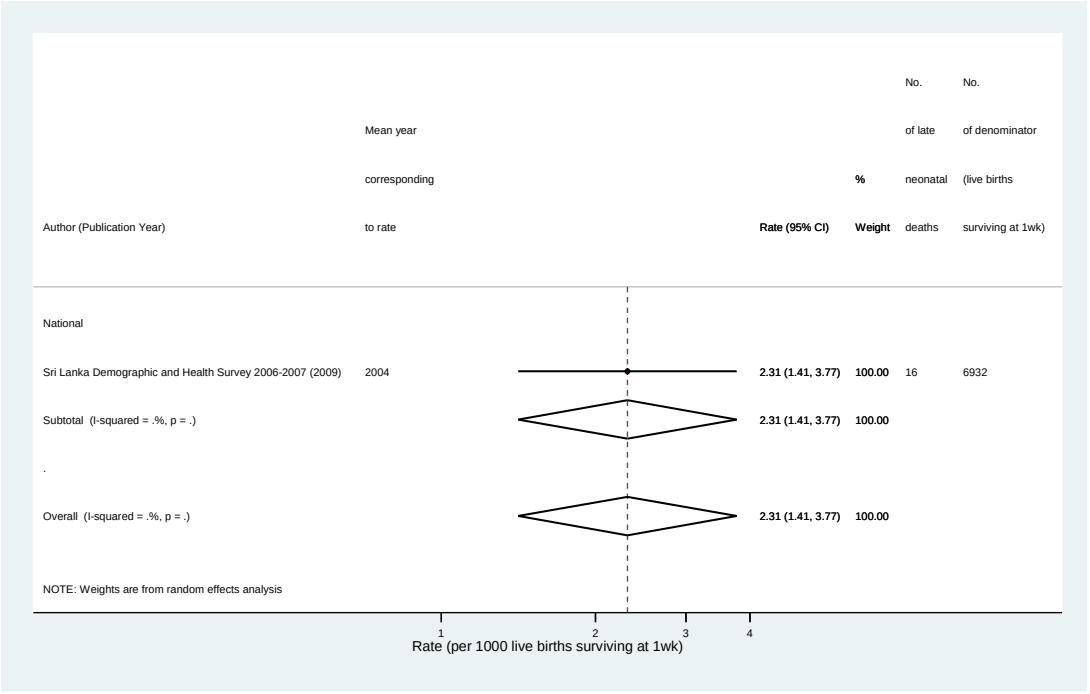
Figure 20. Forest plot showing late neonatal death rates in eligible studies from Pakistan

Figure 21. Forest plot showing late neonatal death rates in eligible studies from Sri Lanka (There were no



Appendix I

Perinatal death rates:

The pooled perinatal death rates obtained from the forest plots are shown in Figures 22-28

Figure 22. National level estimate for the perinatal death rate in Afghanistan (There were no eligible sub-national studies)

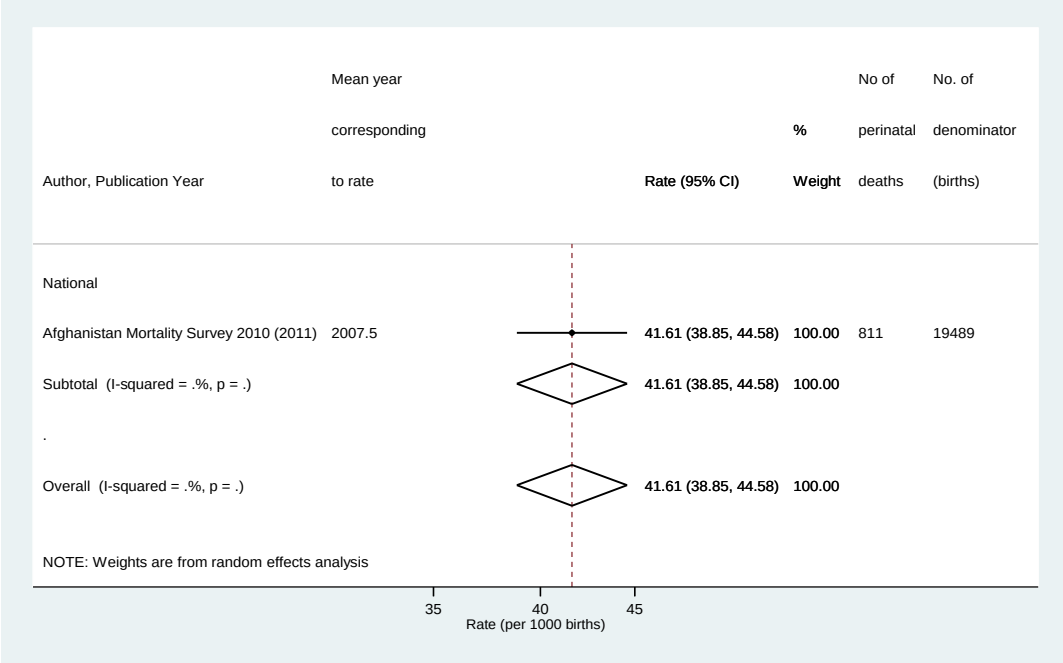


Figure 22. National level estimate for the perinatal death rate in Afghanistan (There were no eligible sub-national studies)

Figure 23. Forest plot showing perinatal death rates in eligible studies from Bangladesh according to coverage of study (sub-national vs. national)

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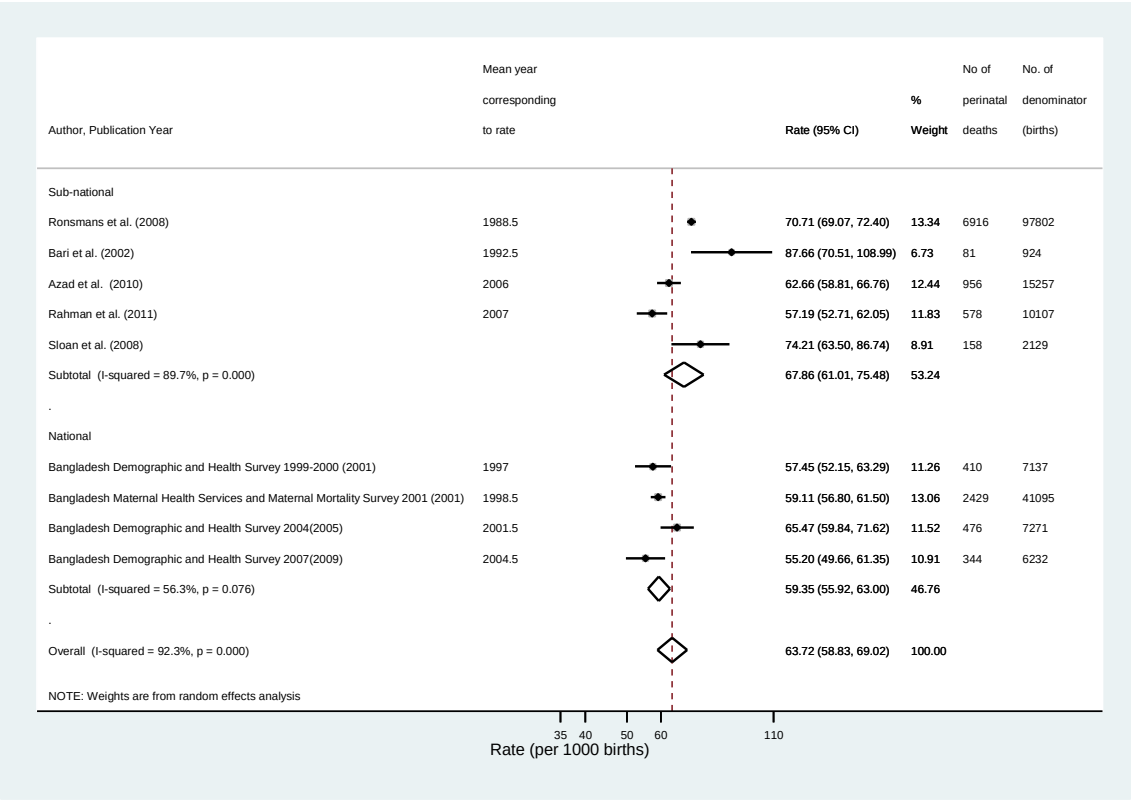

Figure 23. Forest plot showing perinatal death rates in eligible studies from Bangladesh according to coverage of study (sub-national vs. national)

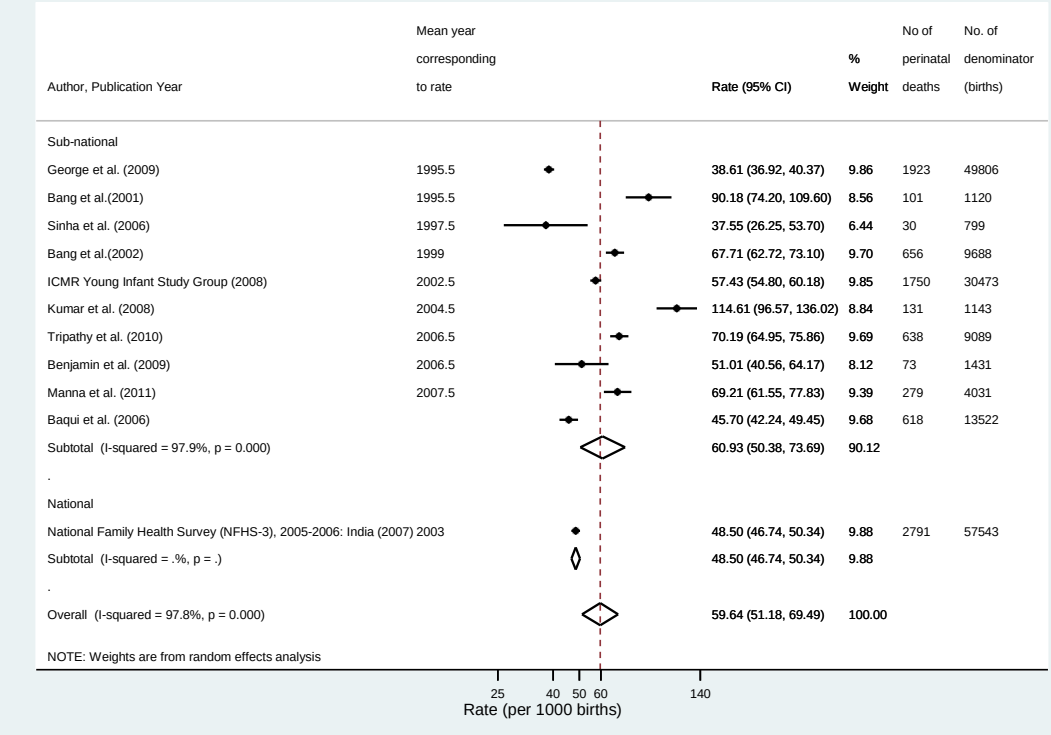

Figure 24. Forest plot showing perinatal death rates in eligible studies from India according to coverage of study (sub-national vs. national)

Appendix I

Figure 25. National level estimate for the perinatal death rate in Maldives (There were no eligible sub-national studies)

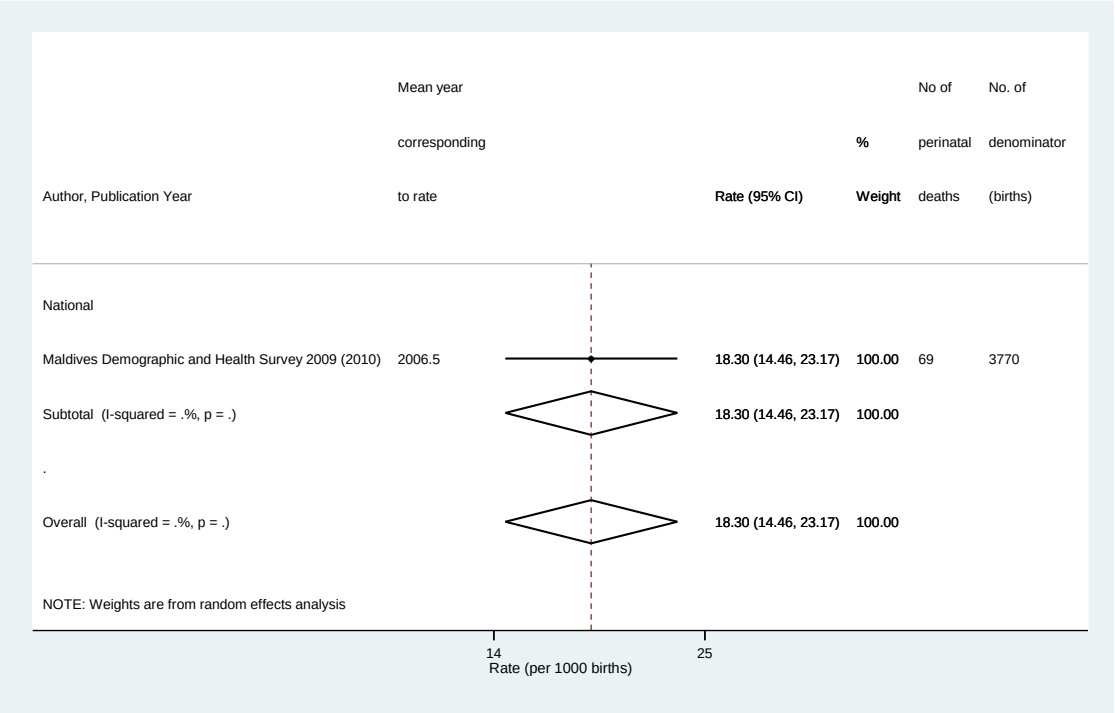

Figure 25. National level estimate for the perinatal death rate in Maldives (There were no eligible sub-national studies)

Figure 26. Forest plot showing perinatal death rates in eligible studies from Nepal according to coverage of study (sub-national vs. national)

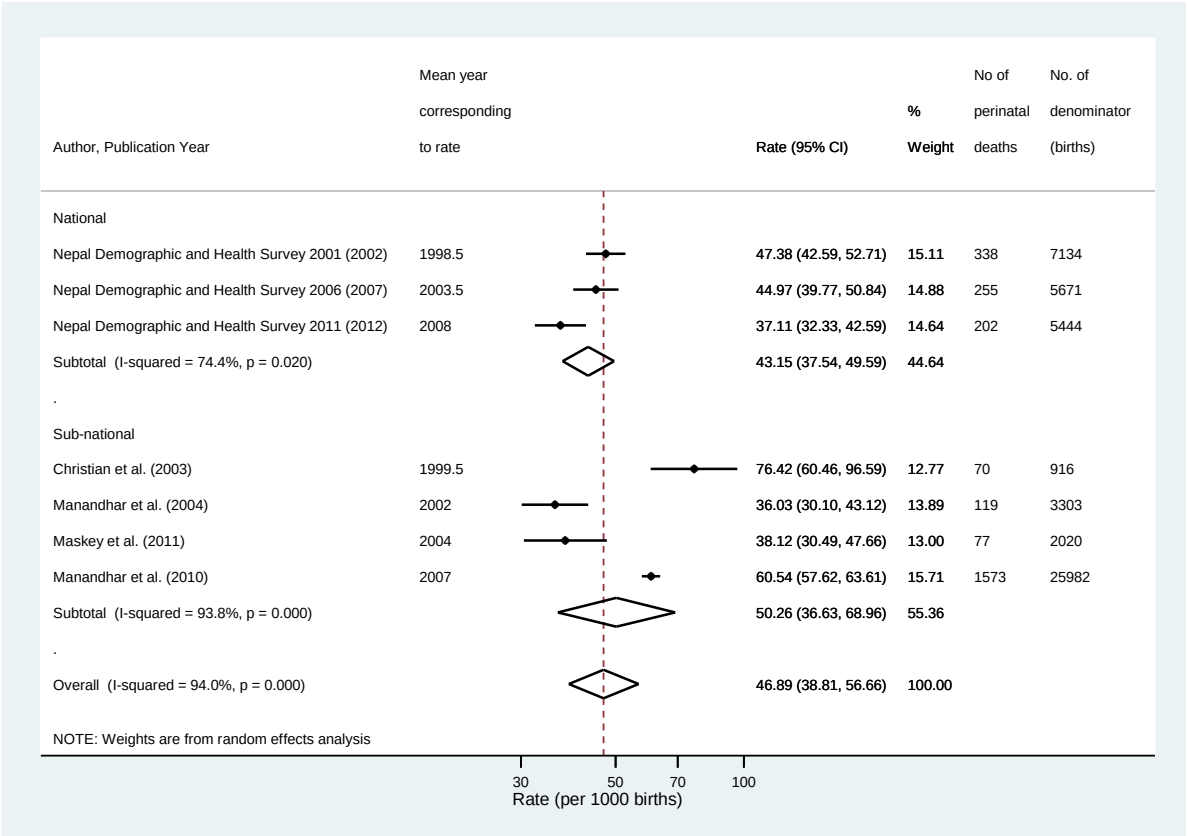

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Figure 26. Forest plot showing perinatal death rates in eligible studies from Nepal according to coverage of study (sub-national vs. national)

Figure 27. Forest plot showing perinatal death rates in eligible studies from Pakistan according to coverage of study (sub-national vs. national)

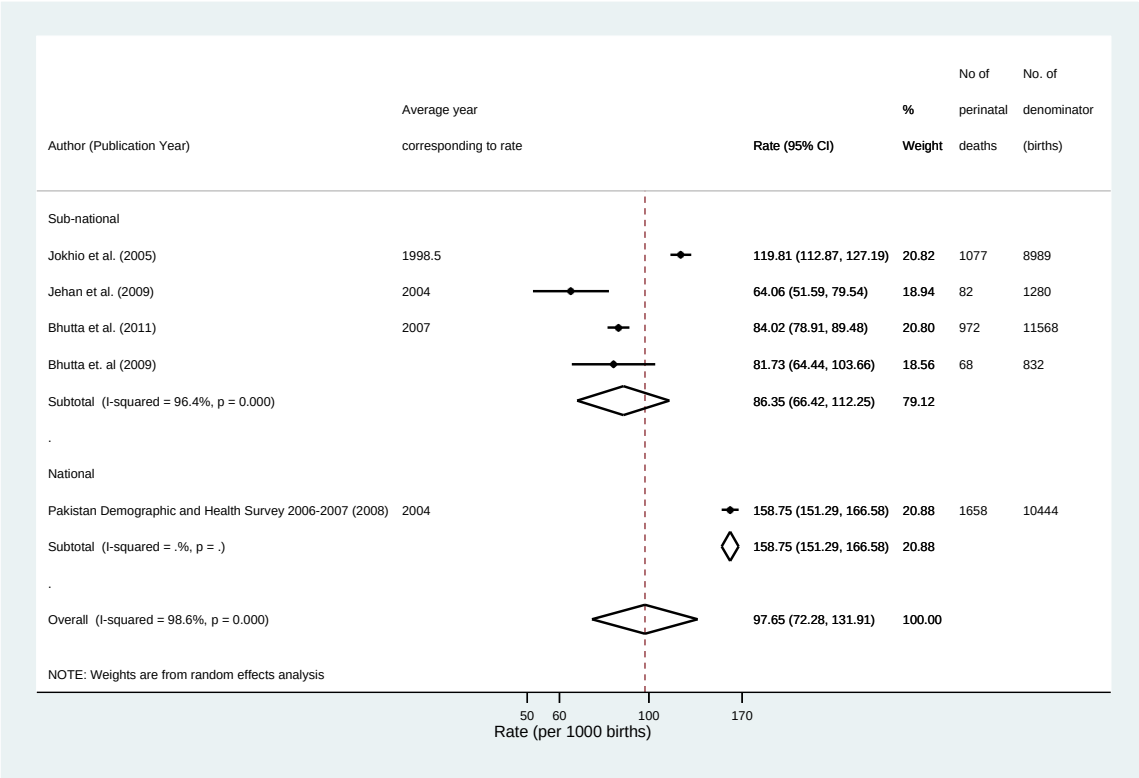

Figure 27. Forest plot showing perinatal death rates in eligible studies from Pakistan according to coverage of study (sub-national vs. national)

Figure 28. National level estimate for the perinatal death rate in Sri Lanka (There were no eligible sub-national studies)

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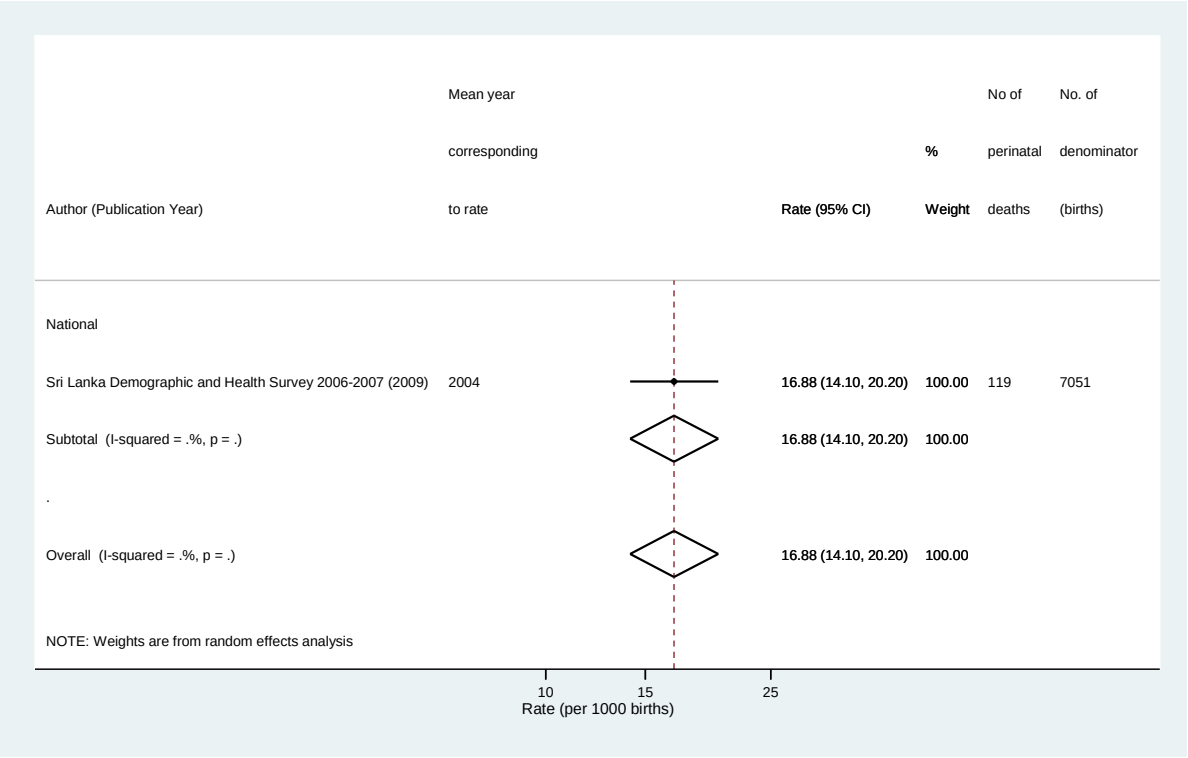

the perinatal death rate in Sri Lanka (There were no eligible sub-national studies) Figure 29.

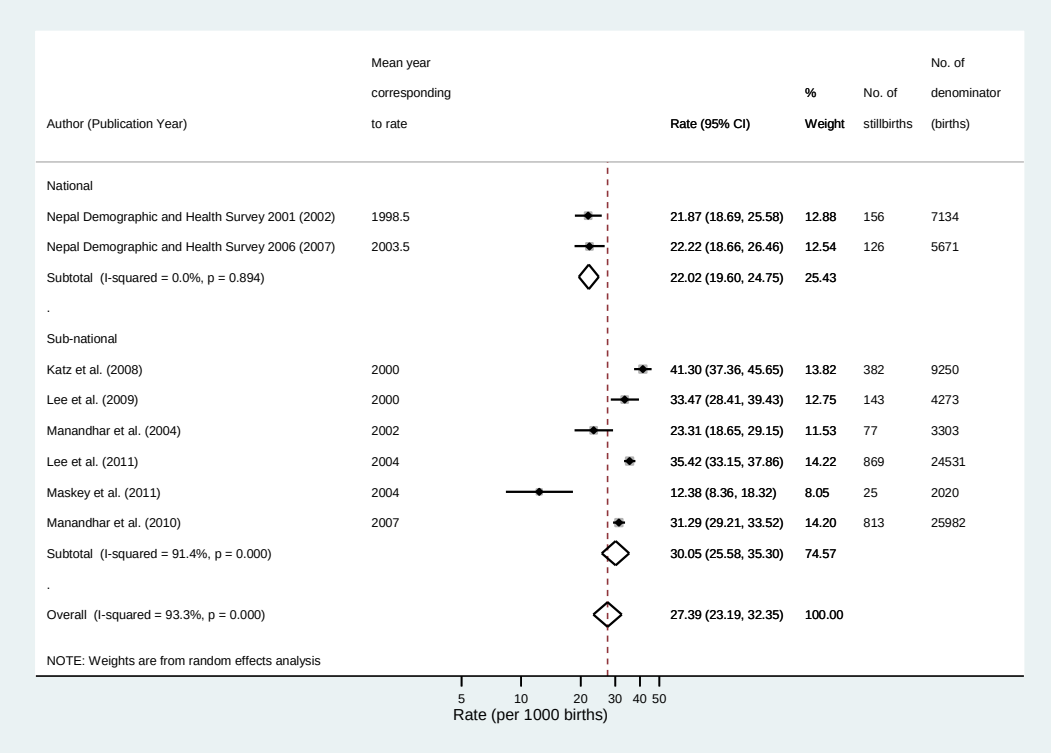

Figure 29. Forest plot showing stillbirth rates in eligible studies from Nepal according to coverage of study (sub-national vs. national) (Nepal Demographic and Health Survey 2011 excluded).

Figure 30.

Appendix I

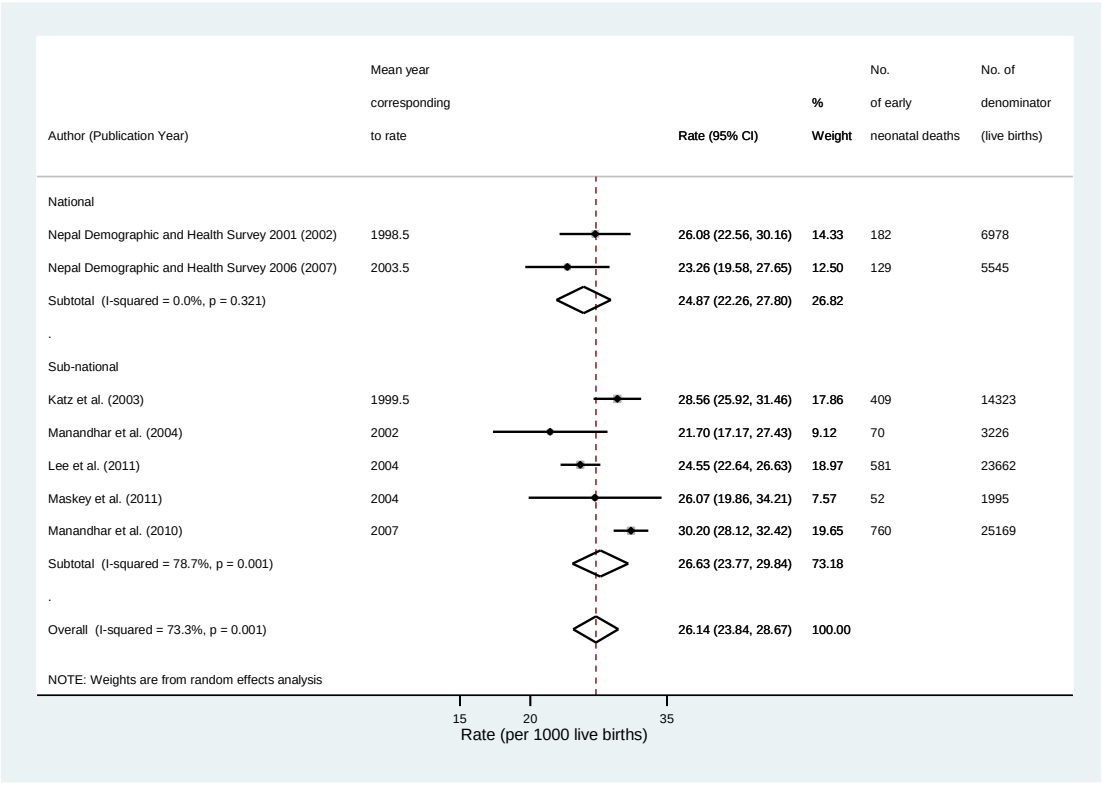

Figure 30. Forest plot showing early neonatal death rates in eligible studies from Nepal according to coverage of study (sub-national vs. national) (Nepal Demographic and Health Survey 2011 excluded).

Figure 31.

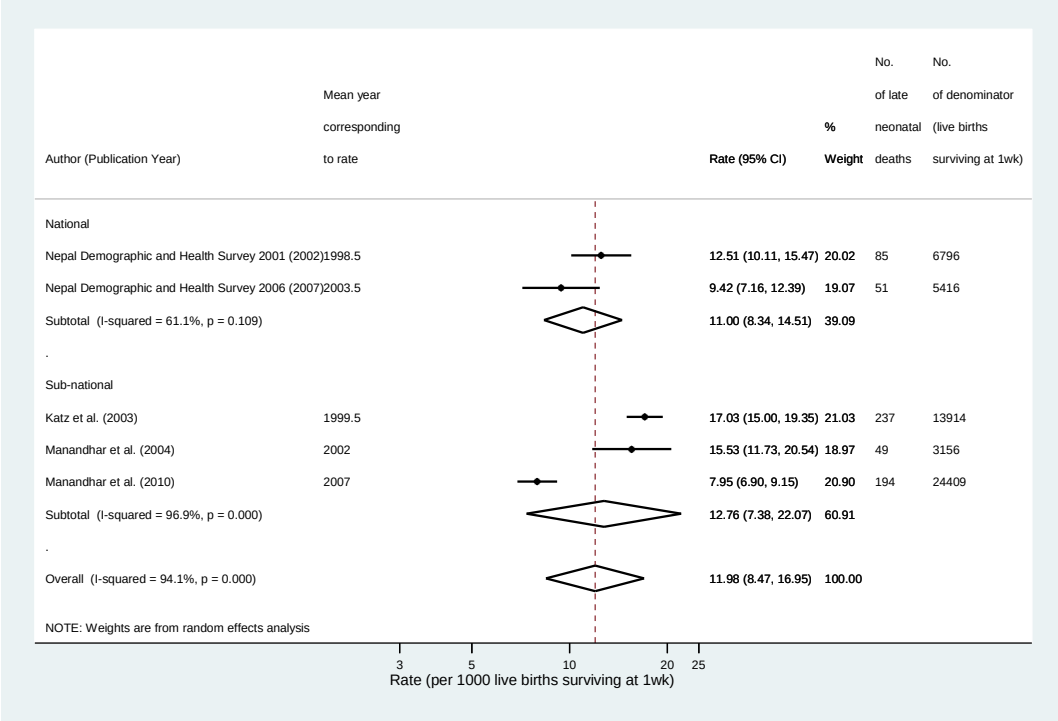

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Figure 31. Forest plot showing late neonatal death rates in eligible studies from Nepal according to coverage of study (sub-national vs. national) (Nepal Demographic and Health Survey 2011 excluded).

Figure 32.

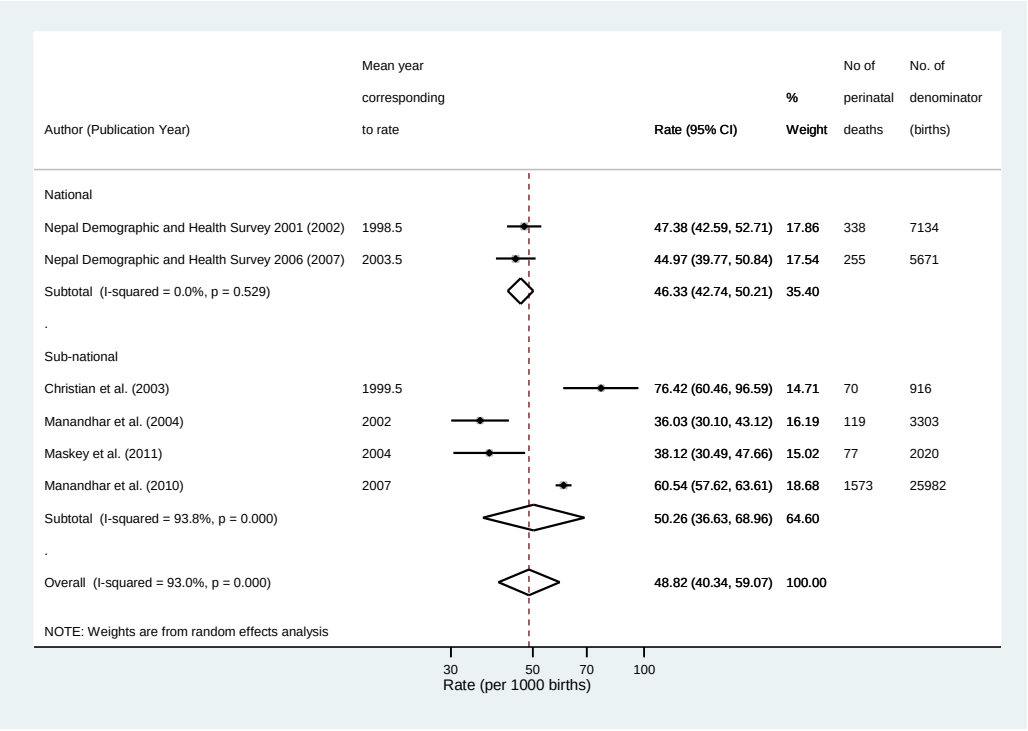

Figure 32. Forest plot showing perinatal death rates in eligible studies from Nepal according to coverage of study (sub-national vs. national) (Nepal Demographic and Health Survey 2011 excluded).

Figure 33.

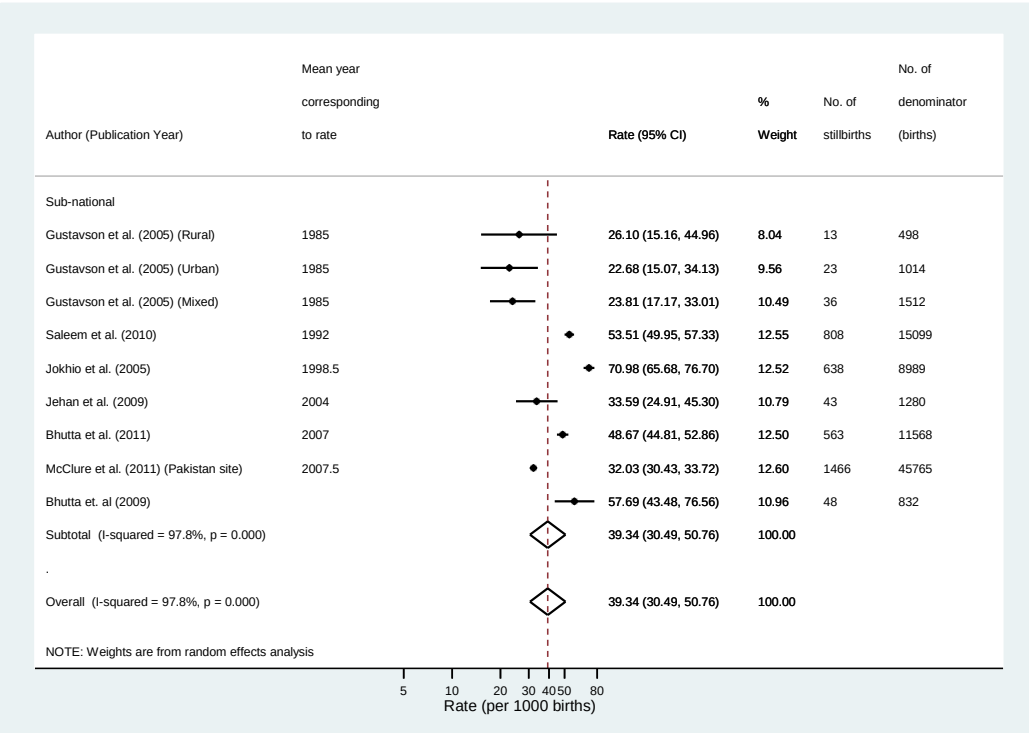

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Figure 33. Forest plot showing stillbirth rates in eligible studies from Pakistan according to coverage of study (sub-national vs. national) (Pakistan Demographic and Health Survey 2006-2007 excluded).

Figure 34.

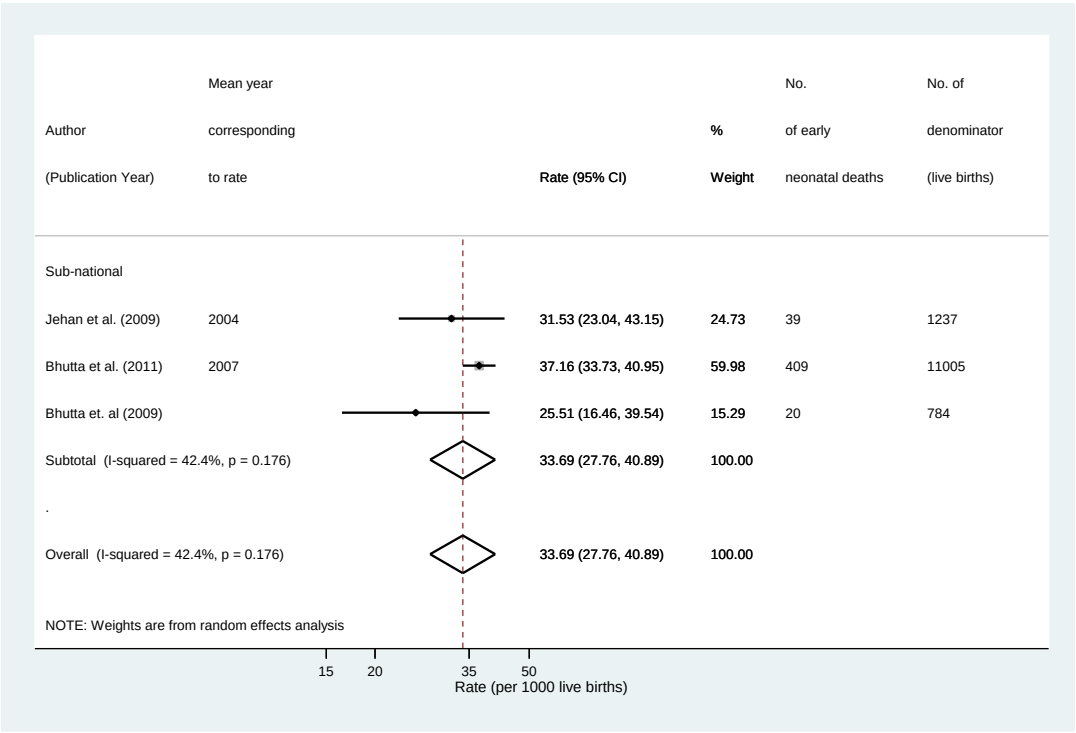

Figure 34. Forest plot showing early neonatal death rates in eligible studies from Pakistan according to coverage of study (sub-national vs. national) (Pakistan Demographic and Health Survey 2006-2007 excluded).

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Figure 35.

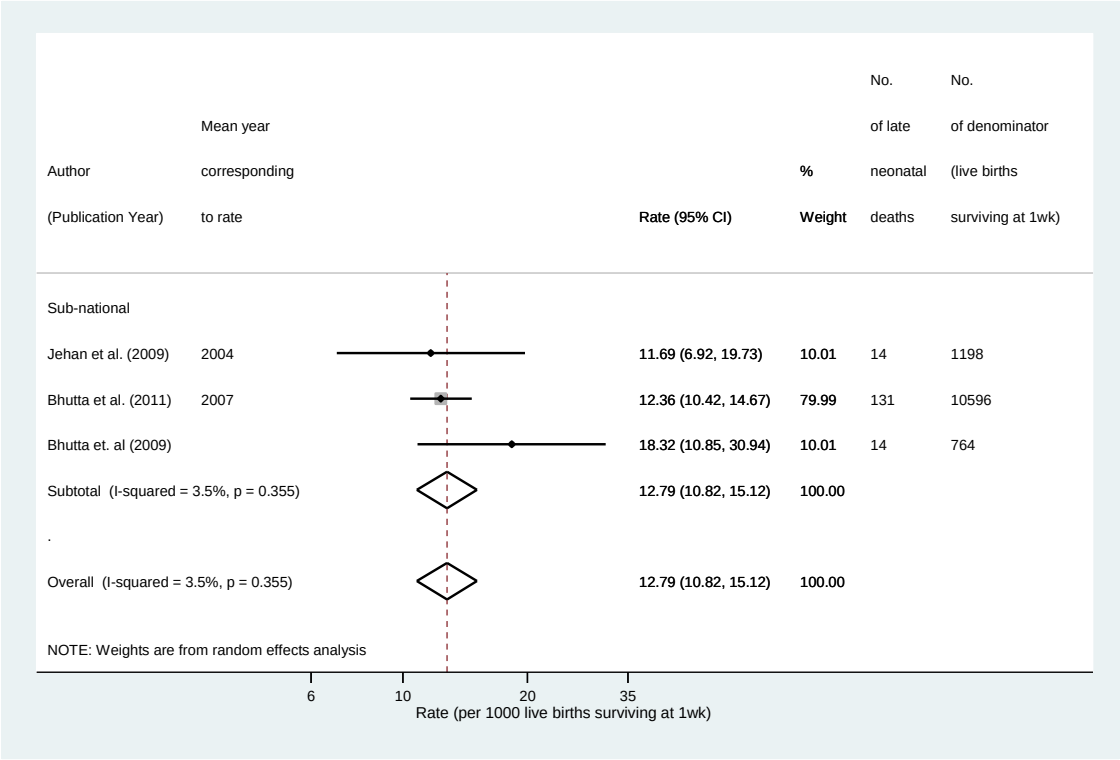

Figure 35. Forest plot showing late neonatal death rates in eligible studies from Pakistan according to coverage of study (sub-national vs. national) (Pakistan Demographic and Health Survey 2006-2007 excluded).

Figure 36.

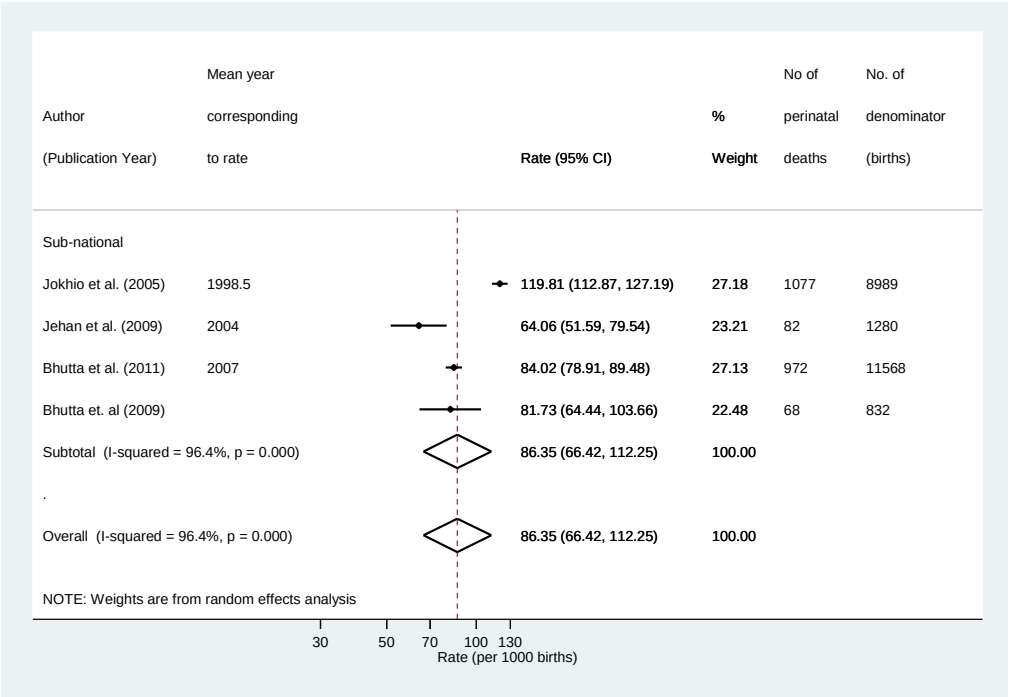

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Figure 36. Forest plot showing perinatal death rates in eligible studies from Pakistan according to coverage of study (sub-national vs. national) (Pakistan Demographic and Health Survey 2006-2007 excluded).

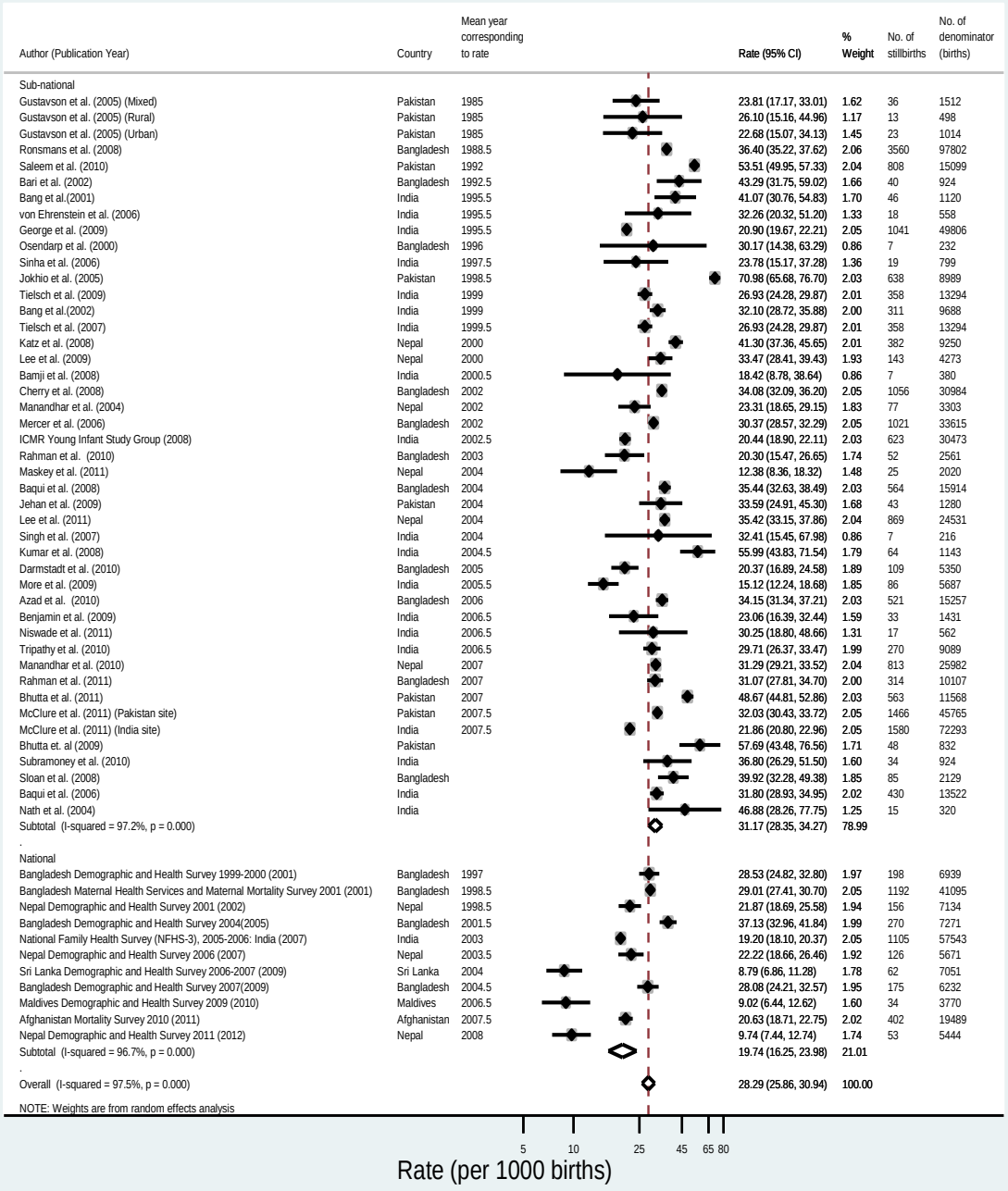

Fig 37: Forest plot showing stillbirth rates for South Asia (Pakistan Demographic and Health Survey 2006-2007 excluded)

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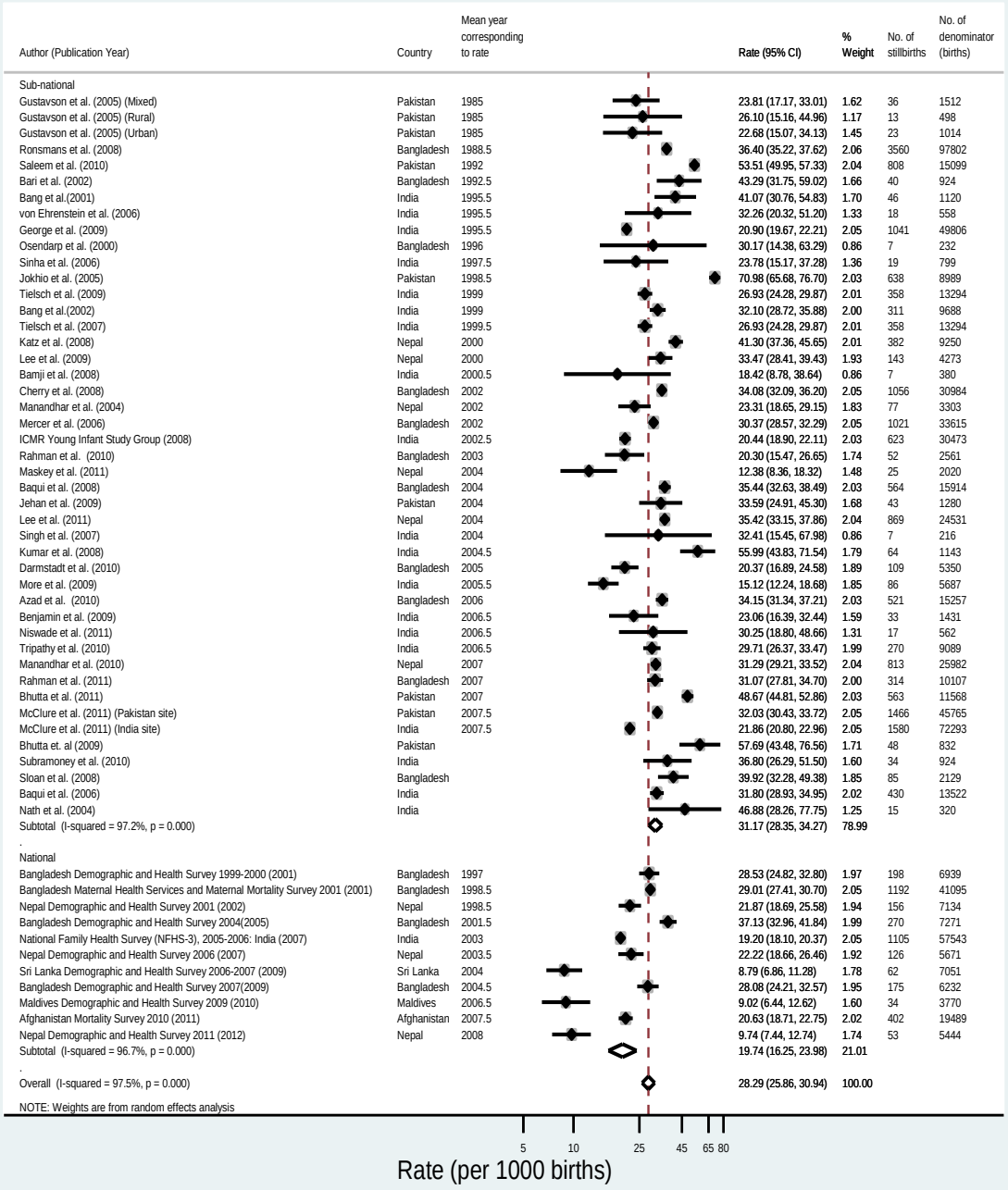

Fig 38 : Forest plot showing early neonatal death rates for South Asia (Pakistan Demographic and Health Survey 2006-2007 excluded)

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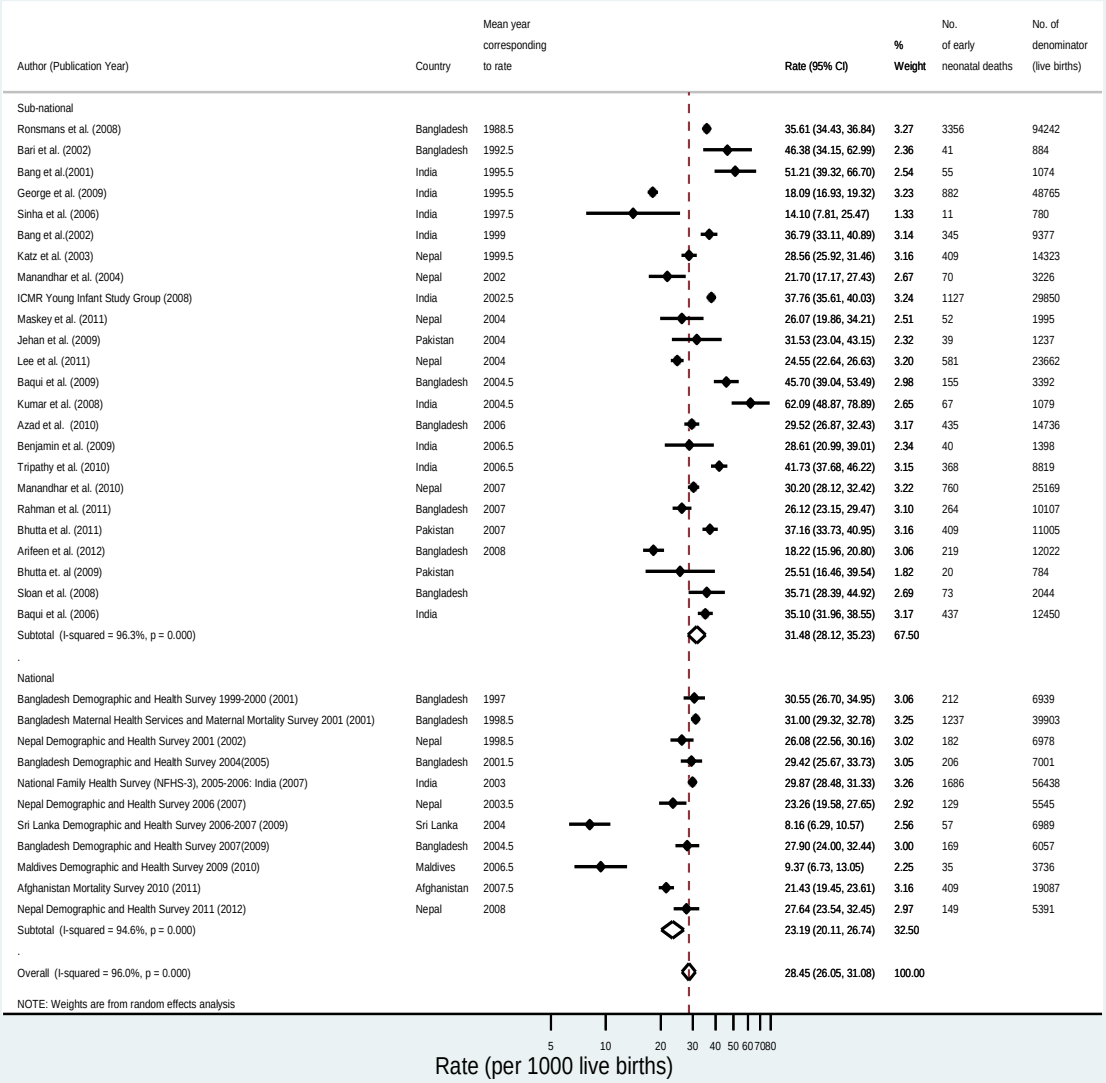

Fig 38 : Forest plot showing early neonatal death rates for South Asia (Pakistan Demographic and Health Survey 2006-2007 excluded)

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Fig 39 : Forest plot showing late neonatal death rates for South Asia (Pakistan Demographic and Health Survey 2006-2007 excluded)

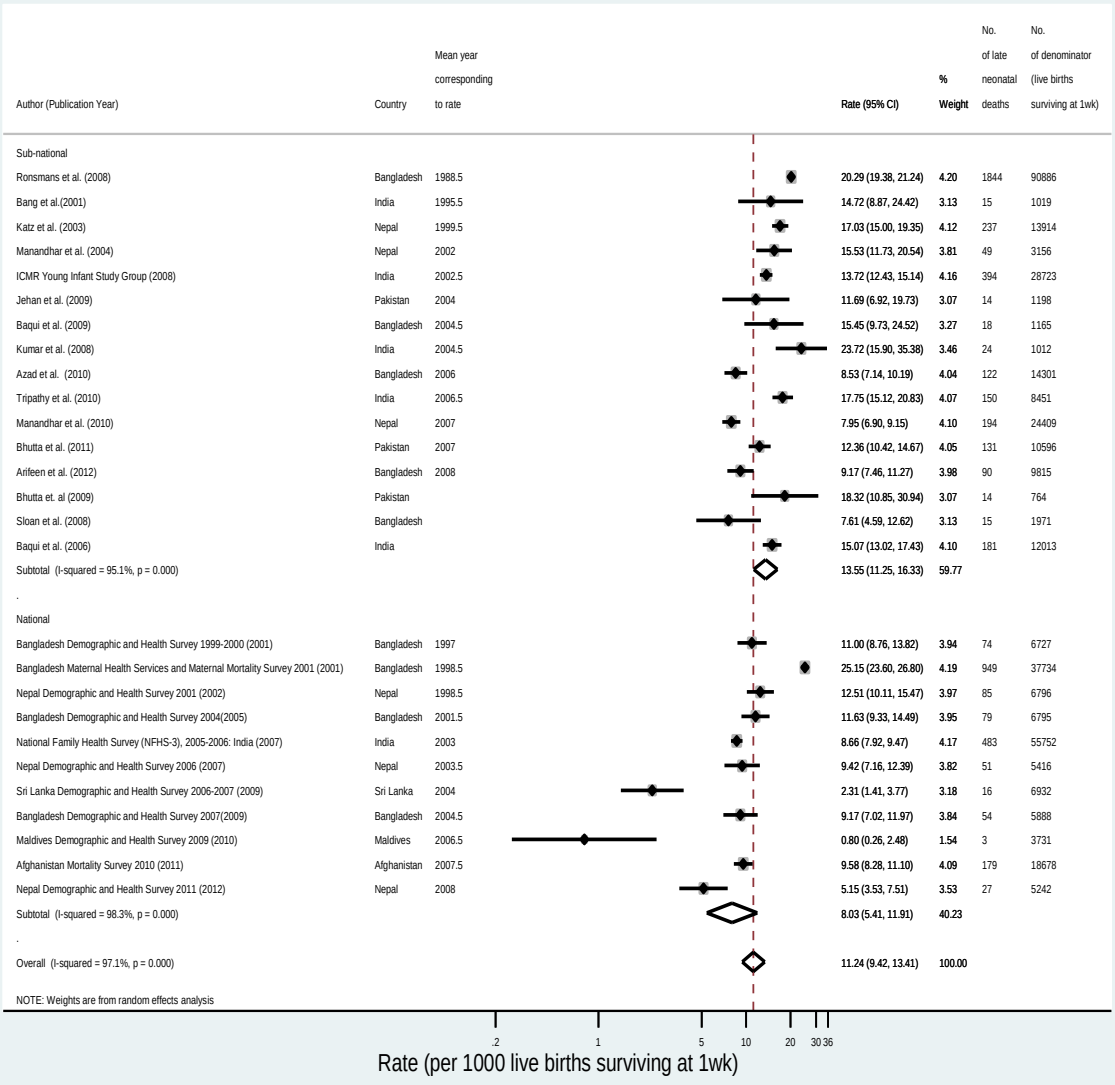

Fig 39 : Forest plot showing late neonatal death rates for South Asia (Pakistan Demographic and Health Survey 2006-2007 excluded)

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Fig 40: Forest plot showing perinatal death rates for South Asia (Pakistan Demographic and Health Survey 2006-2007 excluded)

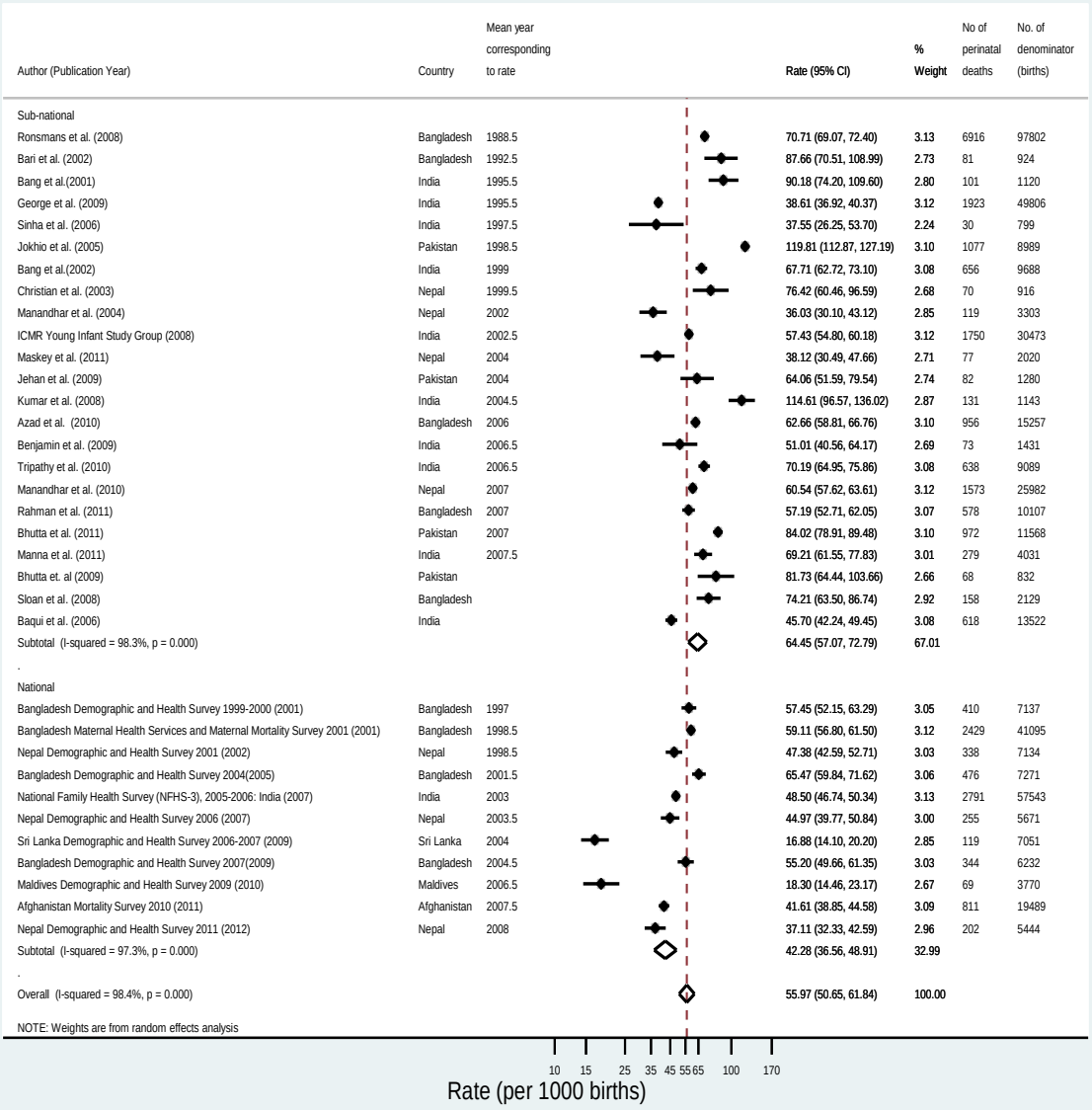

Fig 40: Forest plot showing perinatal death rates for South Asia (Pakistan Demographic and Health Survey 2006-2007 excluded)

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Fig 41 : Forest plot showing stillbirth rates for South Asia (Nepal Demographic and Health Survey 2011 and Pakistan Demographic and Health Survey

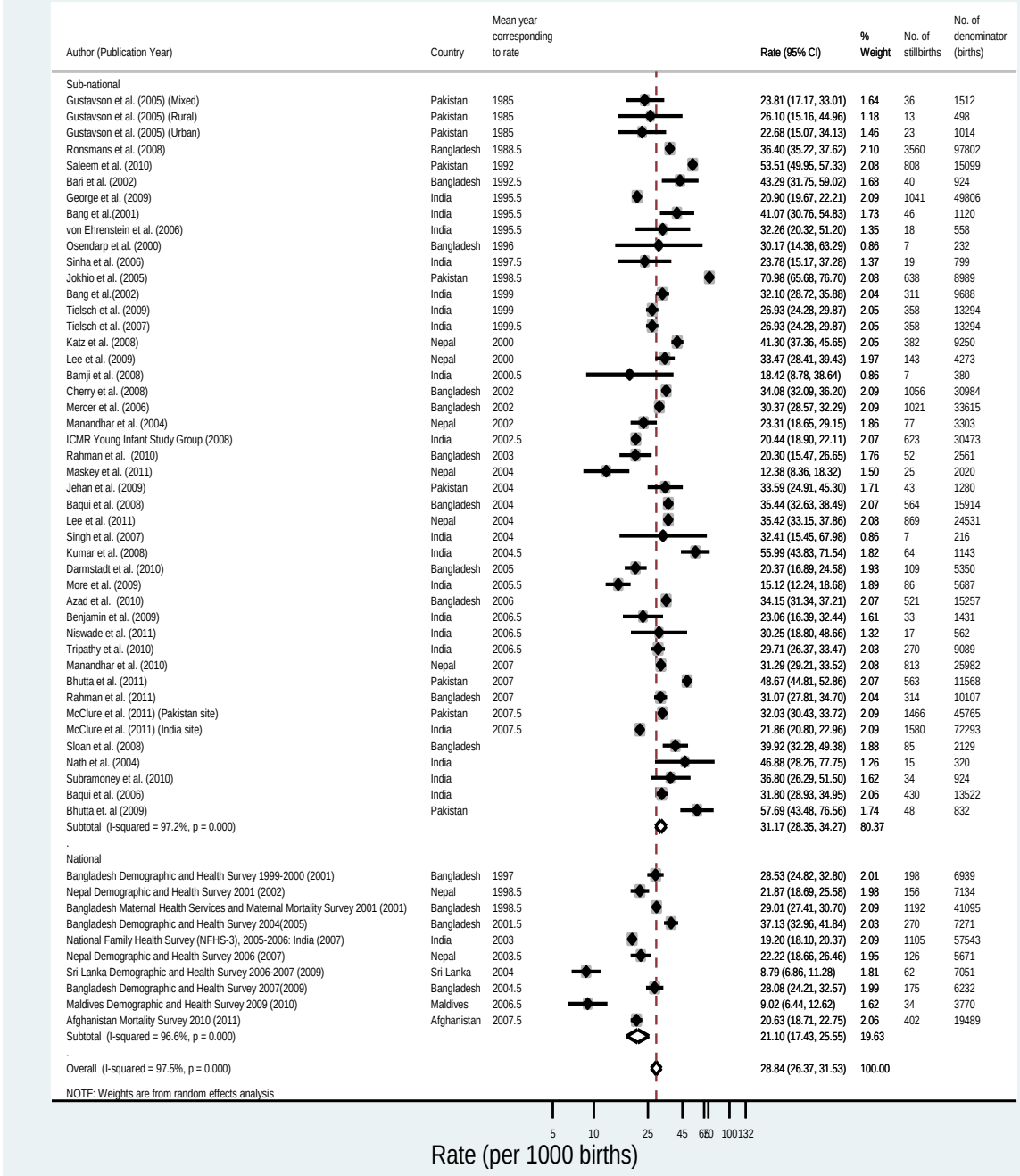

Fig 41 : Forest plot showing stillbirth rates for South Asia (Nepal Demographic and Health Survey 2011 and Pakistan Demographic and Health Survey 2006-2007 excluded)

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Fig 42 : Forest plot showing early neonatal death rates for

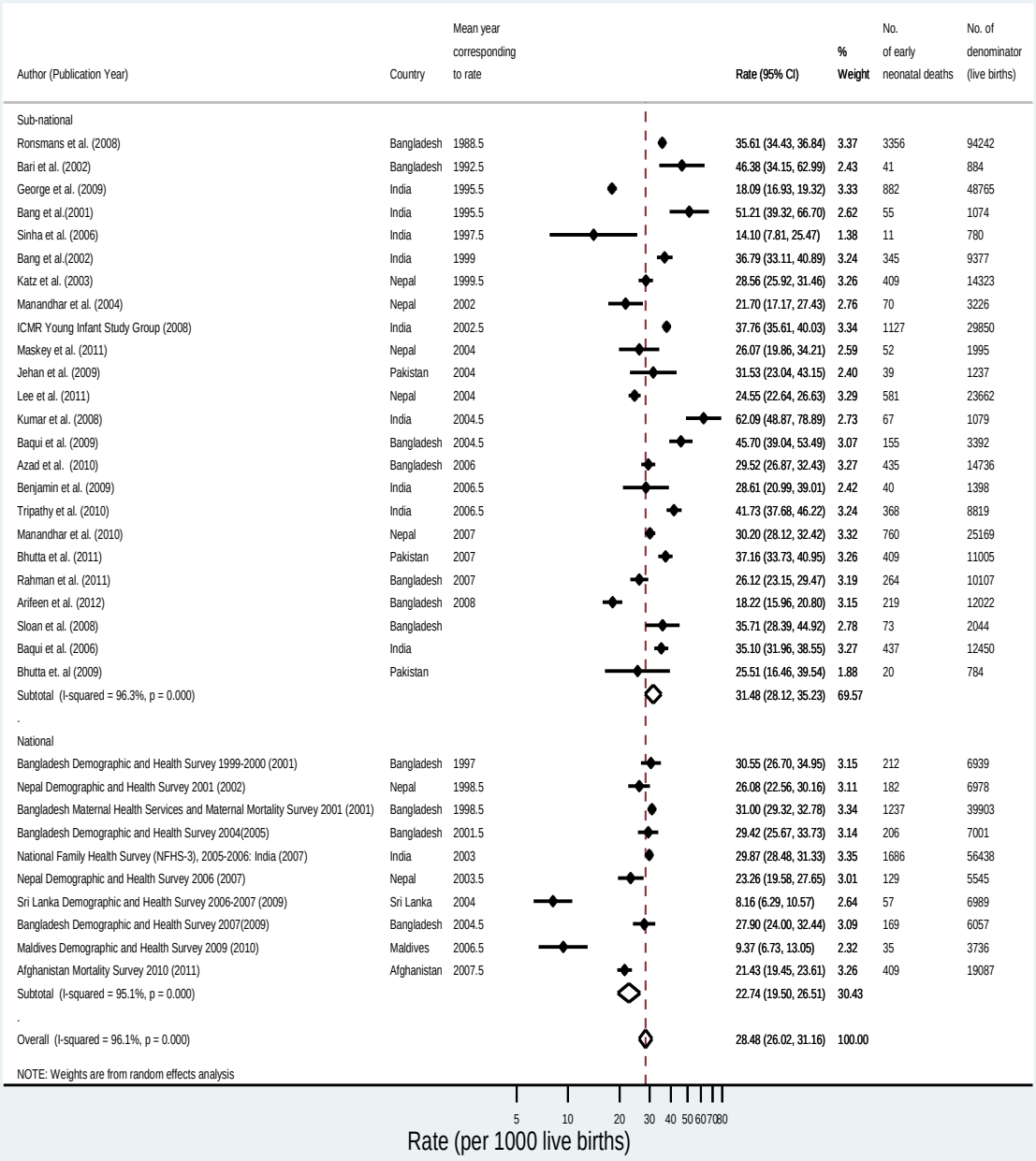

Fig 42 : Forest plot showing early neonatal death rates for South Asia (Nepal Demographic and Health Survey 2011 and Pakistan Demographic and Health Survey 2006-2007 excluded)

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Fig 43: Forest plot showing late neonatal death rates for South Asia (Nepal Demographic and Health Survey 2011 and Pakistan Demographic and Health Survey 2006-2007 excluded)

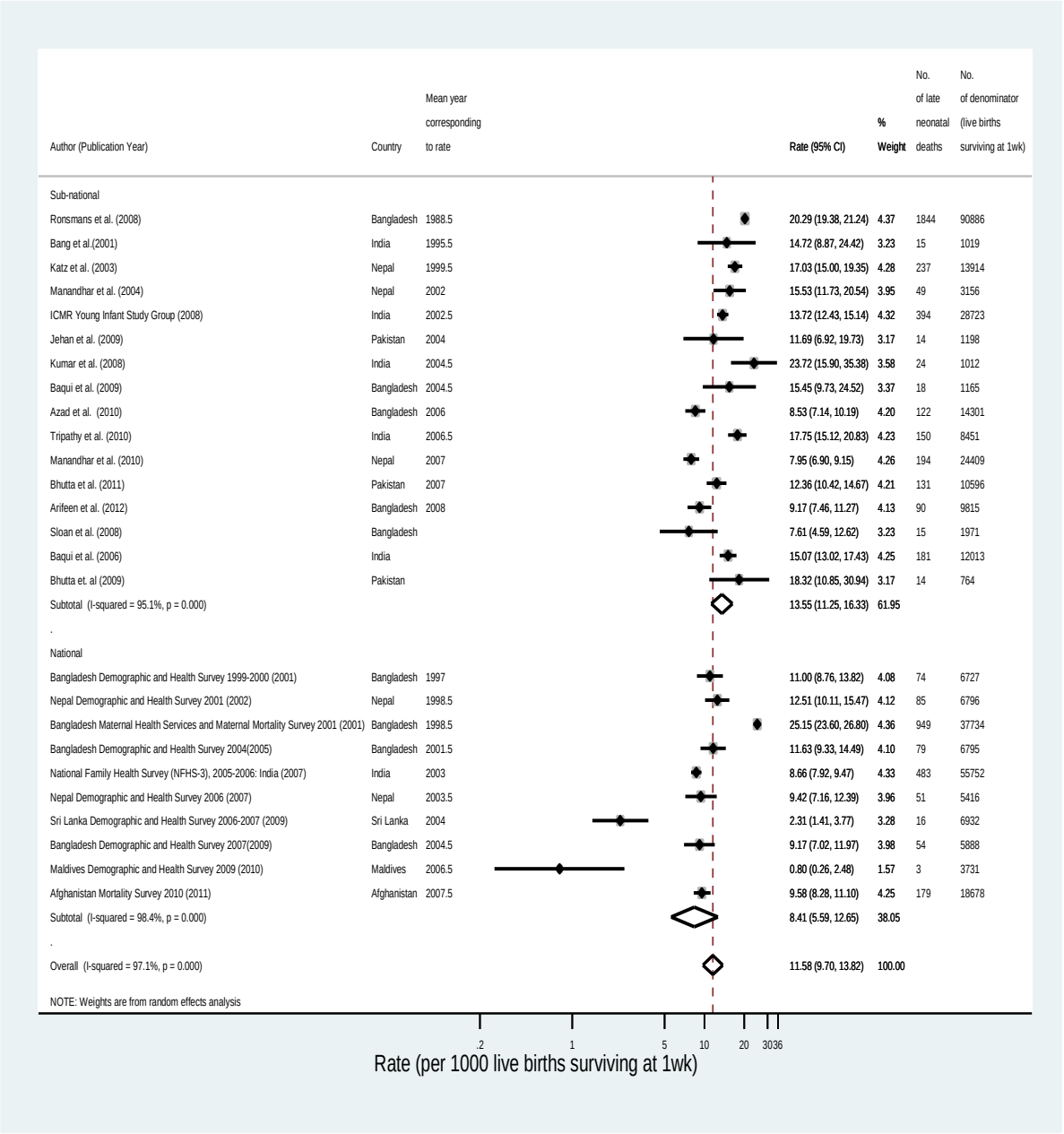

Fig 43: Forest plot showing late neonatal death rates for South Asia (Nepal Demographic and Health Survey 2011 and Pakistan Demographic and Health Survey 2006-2007 excluded)

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Fig 44 : Forest plot showing perinatal death rates for South Asia (Nepal Demographic and Health Survey 2011 and Pakistan Demographic and Health Survey 2006-2007 excluded)

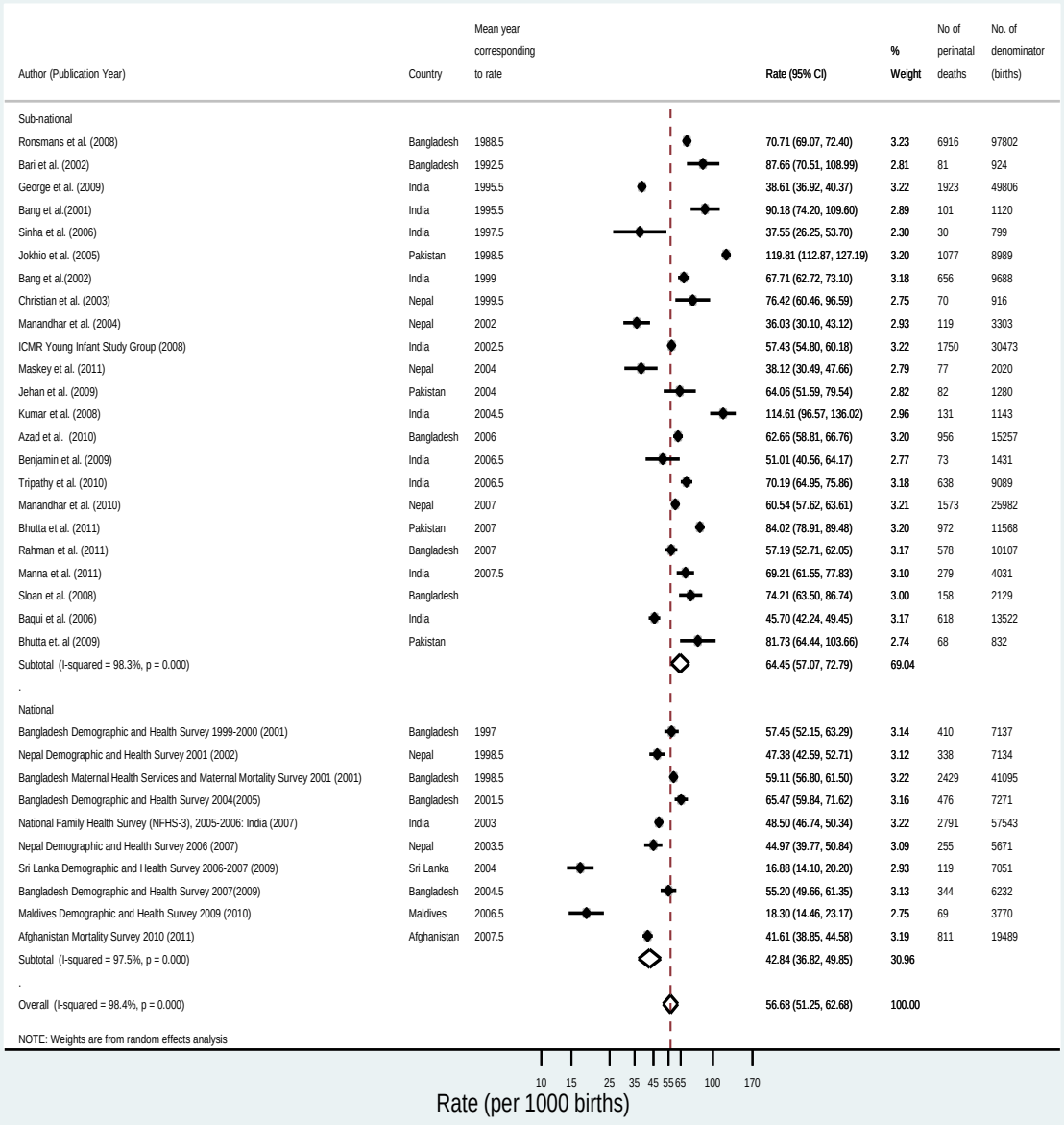

Fig 44 : Forest plot showing perinatal death rates for South Asia (Nepal Demographic and Health Survey 2011 and Pakistan Demographic and Health Survey 2006-2007 excluded)

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Figure 45.

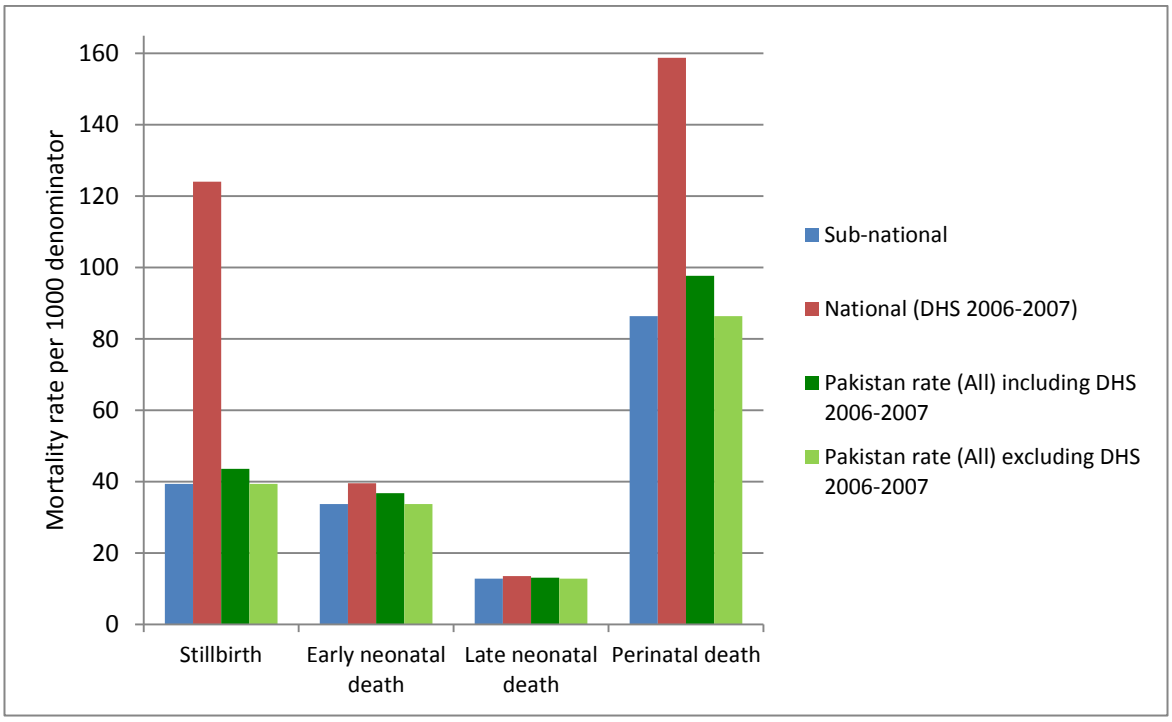

Figure 45. National and sub-national mortality rates in Pakistan.

Figure 46.

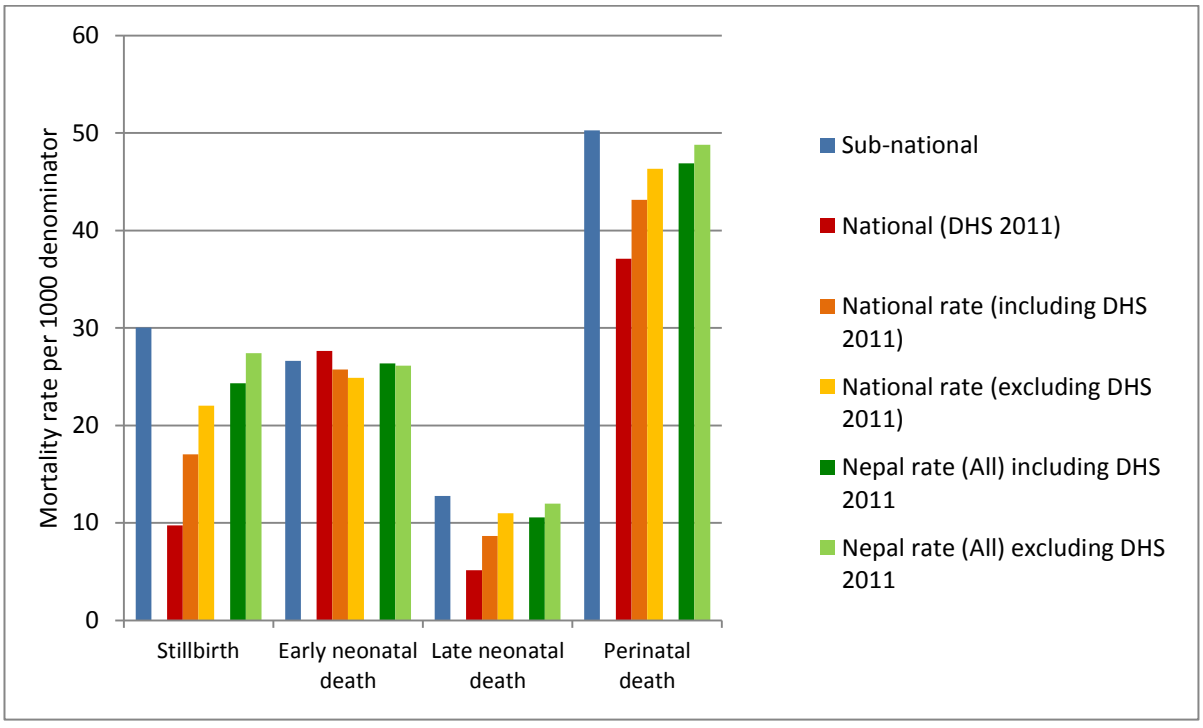

Figure 46. National and sub-national mortality rates in Nepal.

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Table 1: Risk-of-bias within sub-national studies from Bangladesh

Study	Ascertainment of pregnancy	Ascertainment of birth	Ascertainment of death	Definitions of all mortality outcomes measured by the study				Overall risk-of-bias
				Definition of stillbirth	Definition of early neonatal death	Definition of late neonatal death	Definition of perinatal death	
Arifeen et al. (2012)	CHW* visits households two-monthly. PI** method: LMP date **Low risk**	By family informant **High Risk**	CHW visits on Days 1, 3, 6, 9, 15 and also on any one day between Days 28-35 **Low risk**	_	Within 7 days of birth **Low risk**	No information reported **Unclear risk**	_	**Unclear risk**
Rahman et al. (2011)	CHW visits households monthly/two-monthly PI method: LMP date (and urine test) **Low risk**	CHW visits households monthly/two-monthly **Low risk**	CHW visits households monthly/two-monthly **Low risk**	GA:after 28 weeks **Low risk**	Within 7 days of birth **Low risk**	_	SB def†: Low risk END def‡: Low risk Overall risk: **Low risk**	**Low risk**
Rahman et al. (2010)	CHW visits households monthly PI method: urine test (and confirmed by ultrasound) **Low risk**	specially trained 'team' visit pregnant women monthly. **Unclear risk**	specially trained 'team' visit households monthly. **Unclear risk**	GA:after 28 weeks **Low risk**	_	_	_	**Unclear risk**
Azad et al. (2010)	Surveillance **High risk**	Monthly reporting by traditional birth attendant. Recently delivered women also identify other births in the area. **High risk**	Monthly reporting by traditional birth attendant. **High risk**	GA:after 28 weeks **Low risk**	Within 6 days of birth **Low risk**	From 7- 28 days after birth Low risk	SB def: Low risk END def: Low risk Overall risk: **Low risk**	**High risk**
Darmstadt et al. (2010)	Cross-sectional study **High risk**	Women's recall for pregnancy outcomes **High risk**	Women's recall for pregnancy outcomes **High risk**	No definition **Unclear risk**	_	_	_	**Unclear risk**
Baqui et al. (2009)	CHW visits households every 2 months PI method: LMP date **Low risk**	By community informant **High Risk**	CHW visits on Days 1, 3, 7 and on any one day between Days 29-35. **Low risk**	_	Within 6 days of birth Low risk	From 7-27 days after birth Low risk	_	**High risk**
Baqui et al. (2008)	CHW visits households every 2 months PI method: LMP date **Low risk**	By community informant **High Risk**	By community informant **High Risk**	GA:after 28 weeks **Low risk**	_	_	_	**High risk**

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Study	Ascertainment of pregnancy	Ascertainment of birth	Ascertainment of death	Definitions of all mortality outcomes measured by the study				Overall risk-of-bias
				Definition of stillbirth	**Definition of early neonatal death**	**Definition of late neonatal death**	**Definition of perinatal death**	
Sloan et al. (2008)	CHW visits households every 3 months. PI method: not reported. **Unclear risk**	Unclear **Unclear risk**	By CHW (frequency of visit not reported) **Unclear risk**	No definition **Unclear risk**	In the first 7 days of life **Low risk**	During 8-28 days of life **Low risk**	SB def: Unclear risk END def: Low risk Overall risk: **Unclear risk**	**Unclear risk**
Cherry et al. (2008)	Female 'paramedic' visits households (visit frequency not reported). PI method: not reported **Unclear risk**	Unclear **Unclear risk**	Unclear **Unclear risk**	GA: not reported **High risk**	_	_	_	**Unclear risk**
Ronsmans et al. (2008)	CHW visits households monthly PI method: LMP date **Low risk**	CHW visits households monthly **Low risk**	CHW visits households monthly **Low risk**	GA:after 28 weeks **Low risk**	In the first 7 days of life **Low risk**	During 8-28 days of life **Low risk**	SB def: Low risk END def: Low risk Overall risk: **Low risk**	**Low risk**
Mercer et al. (2006)	CHW visits households every 2 months.PI method: unclear **Unclear risk**	Birth and immunization records. **High risk**	Birth and immunization records. **High risk**	No definition **Unclear risk**			_	**Unclear risk**
Bari et al. (2002)	Monthly home visits. PI method: unclear Person reporting pregnancies not reported **Unclear risk**	Monthly home visits (Person reporting births not reported) **Unclear risk**	Monthly home visits (Person reporting deaths not reported) **Unclear risk**	No definition **Unclear risk**	Within 7 days of birth **Low risk**	_	SB def: Unclear risk END def: Low risk Overall risk: **Unclear risk**	**Unclear risk**
Osendarp et al. (2000)	Unclear PI method:by 'an established PI system' **Unclear risk**	Unclear **Unclear risk**	Unclear **Unclear risk**	No definition. Includes infants who died shortly after birth (time not specified) **Unclear risk**	_	_	_	**Unclear risk**

*CHW- community health worker **PI-pregnancy identification ***GA-gestational age †SB Def:Stillbirth definition ‡END Def: Early neonatal death definition

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Table 2: Risk-of-bias within sub-national studies from India

Study	Ascertainment of pregnancy	Ascertainment of birth	Ascertainment of death	Definitions of all mortality outcomes measured by the study				Overall risk-of-bias
				Definition of stillbirth	Definition of early neonatal death	Definition of late neonatal death	Definition of perinatal death	
Manna et al. (2011)	Cross-sectional study **High risk**	Recall **High risk**	Recall **High risk**	_	_	_	SB def: No information-Unclear risk END def:No information- Unclear risk Overall risk: **Unclear risk**	**Unclear risk**
McClure et al. (2011)a (India site)	Unclear. PI* method not reported. **Unclear risk**	By birth attendants (TBA**, family & health facility), community informants and registry administrators. **High risk**	By birth attendants (TBA, family & health facility), community informants and registry administrators. **High risk**	GA: not specified **High risk**	_	_	_	**Unclear risk**
Niswade et al. (2011)	CHW***s visit households (visit frequency not reported) PI method: not reported **Unclear risk**	By CHW or TBA. **High risk**	Study research assistant visits at birth, Days 1, 7, 28 and 2nd and 4th mths. **Low risk**	No definition **Unclear risk**	_	_	_	**Unclear risk**
Tripathy et al. (2010)	Cross-sectional assessment **High risk**	by community informants (TBA or active village member)**High risk**	by community informants (TBA or active village member)**High risk**	No definition **Unclear risk**	Within 6 days of birth **Low risk**	Within 7-28 days of birth **Low risk**	SB def: Unclear risk END def: Low risk Overall risk: **Unclear risk**	**Unclear risk**
Subramoney et al. (2010)	CHW visits households (visit frequency not reported) PI method: not reported **Unclear risk**	Unclear **Unclear risk**	Unclear **Unclear risk**	GA:after 20 weeks **Low risk**	_	_	_	**Unclear risk**
Tielsch et al. (2009)	Unclear **Unclear risk**	By community informants Verified by research CHW within 72 h of	By community informants Deaths (stillbirths) verified by research	No definition **Unclear risk**	_	_	_	**Unclear risk**

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Study	Ascertainment of pregnancy	Ascertainment of birth	Ascertainment of death	Definitions of all mortality outcomes measured by the study				Overall risk-of-bias
				Definition of stillbirth	Definition of early neonatal death	Definition of late neonatal death	Definition of perinatal death	
		delivery. **High risk**	CHW within 72 h of delivery. **High risk**					
Benjamin et al. (2009)	Unclear **Unclear risk**	Unclear **Unclear risk**	Unclear **Unclear risk**	No definition **Unclear risk**	Unclear **Unclear risk**	_	SB def: Unclear risk END def: Unclear risk Overall risk: **Unclear risk**	**Unclear risk**
George et al. (2009)	CHW visits households weekly. PI method: LMP date**.** **Low risk**	CHW visits households weekly and notes LMP date. **Low risk**	CHW visits households weekly. **Low risk**	GA:between 20 and 50 weeks **Low risk** or birth weight > 400g (measurement not reported). **Unclear risk** **Overall: Unclear risk**	No definition **Unclear risk**	_	SB def: Unclear risk END def: Unclear risk Overall risk: **Unclear risk**	**Unclear risk**
More et al. (2009)	Cross-sectional study **High risk**	By community informant **High Risk**	By community informant **High Risk**	GA:between 20 weeks and birth **Low risk**	_	_	_	**High risk**
Kumar et al. (2008)	Trained evaluation team' member visits households 3-monthly. PI method: LMP date. Reports by pregnant women and community informants. **High risk**	Daily reports by community informants. **High risk**	Daily reports by community informants. By 'evaluation team member' in visit (visit frequency unreported). Also by community informants and in two visits during and after the study by persons (identity unreported) Ascertainment unclear. **Unclear risk**	GA:after 190 days **Low risk**	Within 0-6 days of birth **Low risk**	Within 7-28 days of birth **Low risk**	SB def: Low risk END def: Low risk Overall risk: **Low risk**	**Unclear risk**

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Study	Ascertainment of pregnancy	Ascertainment of birth	Ascertainment of death	Definitions of all mortality outcomes measured by the study				Overall risk-of-bias
				Definition of stillbirth	Definition of early neonatal death	Definition of late neonatal death	Definition of perinatal death	
Bamji et al. (2008)	Cross-sectional study **High risk**	Recall **High risk**	Recall **High risk**	No definition **Unclear risk**	_	_	_	**Unclear risk**
ICMR Young Infant Study Group (2008)	Cross-sectional study **High risk**	Recall **High risk**	Recall **High risk**	No definition **Unclear risk**	Within 7 days of birth **Low risk**	Within 2nd to 4th wks of life. **Low risk**	SB def: Unclear risk END def: Low risk Overall risk: **Unclear risk**	**Unclear risk**
Tielsch et al. (2007)	Unclear. PI method: not reported. **Unclear risk**	Reported by community informants. **High risk**	Reported by community informants. **High risk**	No definition **Unclear risk**	_	_	_	**Unclear risk**
Singh et al. (2007)	Unclear. Research CHW visits household monthly in 11.7% of pregnancies. No visits in remainder. PI method:not reported. **Unclear risk**	Unclear **Unclear risk**	Unclear **Unclear risk**	No definition **Unclear risk**	_	_	_	**Unclear risk**
Baqui et al. (2006)	Cross-sectional study **High risk**	Recall **High risk**	Recall **High risk**	GA:after 28 weeks **Low risk**	Within 0-6 days of birth **Low risk**	Within 7-27 days of birth **Low risk**	SB def: Low risk END def: Low risk Overall risk: **Low risk**	**High risk**
Sinha et al. (2006)	CHWs register all pregnancies but methods are unclear **Unclear risk**	CHWs register all births but methods are unclear **Unclear risk**	CHWs register all deaths but methods are unclear **Unclear risk**	No definition **Unclear risk**	Within 7 days of birth **Low risk**	_	SB def: Unclear risk END def: Low risk Overall risk: **Unclear risk**	**Unclear risk**
von Ehrenstein et al. (2006)	Cross-sectional study **High risk**	Recall **High risk**	Recall **High risk**	No definition **Unclear risk**	_	_	_	**Unclear risk**
Nath et al. (2004)	Cross-sectional study **High risk**	Recall **High risk**	Recall **High risk**	GA:after 28 weeks **Low risk**	_	_	_	**High risk**

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Study	Ascertainment of pregnancy	Ascertainment of birth	Ascertainment of death	Definitions of all mortality outcomes measured by the study				Overall risk-of-bias
				Definition of stillbirth	Definition of early neonatal death	Definition of late neonatal death	Definition of perinatal death	
Bang et al. (2002)	Unclear. CHW visits households once in 6 mths. PI method: not reported **Unclear risk**	Recall **High risk**	Recall **High risk**	GA:after 28 weeks **Low risk**	Within 7 days of birth **Low risk**	_	SB def: Low risk END def: Low risk Overall risk: **Low risk**	**Unclear risk**
Bang et al. (2001)	Unclear. Listing of pregnant women by research CHW (visit frequency not reported).PI method: LMP date. **Unclear risk**	Unclear. Research CHW attended labour and reported some births. Different, male CHWs also 'reported prospectively ' and detected missed births in 6-monthly cross-sectional surveys **Unclear risk**	CHW visited on Days 1,2,3,5,7,14, 21 and 28. Different, male CHWs also 'reported prospectively ' and detected missed deaths in 6-monthly cross-sectional surveys **Unclear risk**	GA:after 28 weeks **Low risk**	Within 0-6 days of birth **Low risk**	Within 7-27 days of birth **Low risk**	SB def: Low risk END def: Low risk Overall risk: **Low risk**	**Unclear risk**

*PI- pregnancy identification **TBA- traditional birth attendant ***CHW-community health worker

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Table 3: Risk-of-bias within sub-national studies from Nepal

Study	Ascertainment of pregnancy	Ascertainment of birth	Ascertainment of death	Definitions of all mortality outcomes measured by the study				Overall risk-of-bias
				Definition of stillbirth	Definition of early neonatal death	Definition of late neonatal death	Definition of perinatal death	
Lee et al. (2011)	CHW* visits households monthly. PI**method: LMP date **Low risk**	By family informants **High risk**	By family informants **High risk**	GA: after 28 weeks **Low risk**	In the first week of life **Low risk**	_	_	**High risk**
Maskey et al. (2011)	Cross-sectional study **High risk**	Recall **High risk**	Recall **High risk**	No information **Unclear risk**	No information **Unclear risk**	_	SB def†: Unclear risk END def‡: Unclear risk Overall risk: **Unclear risk**	**Unclear risk**
Manandhar et al. (2010)	Surveillance **High risk**	By community informant **High risk**	By community informant **High risk**	No information **Unclear risk**	No information **Unclear risk**	No information **Unclear risk**	SB def: Unclear risk END def: Unclear risk Overall risk: **Unclear risk**	**Unclear risk**
Lee et al. (2009)	CHW visits households 5-weekly. PI method: LMP date, urine test **Low risk**	CHW visits households fortnightly until 3 mths after delivery. **Low risk**	CHW visits households fortnightly until 3 mths after delivery. **Low risk**	GA:after 28 weeks **Low risk**	_	_	_	**Low risk**
Katz et al. (2008)	CHW visits households weekly (1st trial) and 5-weekly (2nd trial). PI method: LMP date (both trials) and urine test(2nd trial) **Low risk**	CHW visits weekly (1st trial). **Low risk** Visit frequency unclear (2nd trial) **Unclear risk** **Overall: Unclear risk**	CHW visits weekly till birth, at 3mth and 6 mth (1st trial). **Low risk** Visit frequency unclear (2nd trial) **Unclear risk** **Overall: Unclear risk**	GA:after 28 weeks **Low risk**	_	_	_	**Unclear risk**
Manandhar et al. (2004)	CHW visits households monthly. PI method: LMP date **Low risk**	CHW visit at 7 mths of gestation and 1 mth after delivery **Low risk**	CHW visit at 7 mths of gestation and 1 mth after delivery **Low risk**	GA: after 28 weeks **Low risk**	Within 7 completed days of birth. **Low risk**	Within 7-28 completed days of birth **Low risk**	SB def: Low risk END def: Low risk Overall risk: **Low risk**	**Low risk**

Appendix I

Study	Ascertainment of pregnancy	Ascertainment of birth	Ascertainment of death	Definitions of all mortality outcomes measured by the study				Overall risk-of-bias
				Definition of stillbirth	Definition of early neonatal death	Definition of late neonatal death	Definition of perinatal death	
Christian et al. (2003)	CHW visits households 5-wkly. PI method: LMP date, urine test **Low risk**	CHW visits households twice every week until 3 months after delivery **Low risk**	CHW visits households twice every week until 3 months after delivery **Low risk**	GA:after 28 weeks **Low risk**	Within the first 7 days of life. **Low risk**	_	SB def: Low risk END def: Low risk Overall risk: **Low risk**	**Low risk**
Katz et al. (2003)	CHW visits households weekly. PI method: LMP date **Low risk**	CHW visits households weekly. **Low risk**	CHW visits households weekly and at 3 mths after delivery. **Low risk**	_	Within the first 7 days of life. **Low risk**	Within 8-28 days of birth **Low risk**	_	**Low risk**

*CHW- community health worker **PI-pregnancy identification ***GA-gestational age †SB Def:Stillbirth definition ‡END Def: Early neonatal death definition

Appendix I

Table 4: Risk-of-bias within sub-national studies from Pakistan

Study	Ascertainment of pregnancy	Ascertainment of birth	Ascertainment of death	Definitions of all mortality outcomes measured by the study				Overall risk-of-bias
				Definition of stillbirth	Definition of early neonatal death	Definition of late neonatal death	Definition of perinatal death	
McClure et al. (2011)b (Pakistan site)	Unclear. PI* method not reported. **Unclear risk**	By birth attendants (TBA**, family & health facility), community informants and registry administrators. **High risk**	By birth attendants (TBA, family & health facility), community informants and registry administrators. **High risk**	GA: not specified **High risk**	_	_	_	**Unclear risk**
Bhutta et al. (2011)	Cross-sectional assessment **High risk**	Recall **High risk**	Recall **High risk**	No definition **Unclear risk**	from Day 0-7 of birth **Low risk**	from Day 8-28 of birth **Low risk**	SB def†: Unclear risk END def‡: Low risk Overall risk: **Unclear risk**	**Unclear risk**
Saleem et al. (2010)	Cross-sectional study **High risk**	Recall **High risk**	Recall **High risk**	No definition (as reported by women) **Unclear risk**	_	_	_	**Unclear risk**
Jehan et al. (2009)	Unclear. CHW**** visits households (visit frequency not reported) **Unclear risk**	By home birth attendants and health facilities **High risk**	By home birth attendants and health facilities **High risk**	GA: not specified **High risk**	On or before 7 days of age. **Low risk**	From Day 8-28 of birth **Low risk**	SB def: High risk END def: Low risk Overall risk: **High risk**	**Unclear risk**
Bhutta et. al (2009)	CHW visits households fortnightly. PI method: Not reported **Unclear risk**	CHW visits households fortnightly. **Low risk**	CHWs visit fortnightly and on Days 7, 14 and 28. **Low risk**	≥28 weeks **Low risk**	In the first 7 days of life. **Low risk**	Within 8-28 days of life. **Low risk**	SB def: Low risk END def: Low risk Overall risk: **Low risk**	**Unclear risk**
Jokhio et al. (2005)	CHW visits households monthly **Low risk**	CHW visits households monthly **Low risk**	CHW visits households monthly **Low risk**	GA: after 6 months **Low risk**	_	_	SB def: **Low risk** END def:no information-includes infant deaths upto 28 days- Unclear risk Overall risk: **Unclear risk**	**Unclear risk**

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Study	Ascertainment of pregnancy	Ascertainment of birth	Ascertainment of death	Definitions of all mortality outcomes measured by the study				Overall risk-of-bias
				Definition of stillbirth	Definition of early neonatal death	Definition of late neonatal death	Definition of perinatal death	
Gustavson et al. (2005)a	Unclear. PI method: not reported **Unclear risk**	Unclear. **Unclear risk**	Unclear. **Unclear risk**	No definition **Unclear risk**	_	_	_	**Unclear risk**
Gustavson et al. (2005)b	Unclear. PI method: not reported **Unclear risk**	Unclear. **Unclear risk**	Unclear. **Unclear risk**	No definition **Unclear risk**	_	_	_	**Unclear risk**
Gustavson et al. (2005)c	Unclear. PI method: not reported **Unclear risk**	Unclear. **Unclear risk**	Unclear. **Unclear risk**	No definition **Unclear risk**	_	_	_	**Unclear risk**

*PI-pregnancy identification **TBA-traditional birth attendant ***GA-gestational age †SB Def:Stillbirth definition ‡END Def: Early neonatal death definition ****CHW- community health worker

Appendix I

Table 5: Risk-of-bias within national studies from South Asia

Study	Ascertainment of pregnancy	Ascertainment of birth	Ascertainment of death	Definitions of all mortality outcomes measured by the study				Overall risk-of-bias
				Definition of stillbirth	Definition of early neonatal death	Definition of late neonatal death	Definition of perinatal death	
Afghanistan Mortality Survey 2010 (2011)	Cross-sectional study **High risk**	Recall **High risk**	Recall **High risk**	GA*: after 7 months **Low risk**	Within the first 7 days of life. **Low risk**	Within 7-30 days of life **Low risk**	SB def†: Low risk END def‡: Low risk Overall risk: **Low risk**	**High risk**
Bangladesh Demographic and Health Survey 2007(2009)	Cross-sectional study **High risk**	Recall **High risk**	Recall **High risk**	GA: 7 or more months **Low risk**	During age 0-6 days **Low risk**	Within 7-30 days of life **Low risk**	SB def: Low risk END def: Low risk Overall risk: **Low risk**	**High risk**
Bangladesh Demographic and Health Survey 2004(2005)	Cross-sectional study **High risk**	Recall **High risk**	Recall **High risk**	GA: 7 or more months **Low risk**	During age 0-6 days **Low risk**	Within 7-30 days of life **Low risk**	SB def: Low risk END def: Low risk Overall risk: **Low risk**	**High risk**
Bangladesh Demographic and Health Survey 1999-2000 (2001)	Cross-sectional study **High risk**	Recall **High risk**	Recall **High risk**	GA: 7 or more months **Low risk**	During age 0-7 days **Low risk**	Within 7-30 days of life **Low risk**	SB def: Low risk END def: Low risk Overall risk: **Low risk**	**High risk**
Bangladesh Maternal Health Services and Maternal Mortality Survey 2001 (2001)	Cross-sectional study **High risk**	Recall **High risk**	Recall **High risk**	GA: 7 or more months **Low risk**	During age 0-7 days **Low risk**	Within 7-30 days of life **Low risk**	SB def: Low risk END def: Low risk Overall risk: **Low risk**	**High risk**
National Family Health Survey (NFHS-3), 2005-2006: India (2007)	Cross-sectional study **High risk**	Recall **High risk**	Recall **High risk**	GA: 7 or more months **Low risk**	During age 0-6 days **Low risk**	Within 7-30 days of life **Low risk**	SB def: Low risk END def: Low risk Overall risk: **Low risk**	**High risk**
Maldives Demographic and Health Survey 2009 (2010)	Cross-sectional study **High risk**	Recall **High risk**	Recall **High risk**	GA: 7 or more months **Low risk**	During age 0-6 days **Low risk**	Within 7-30 days of life **Low risk**	SB def: Low risk END def: Low risk Overall risk: **Low risk**	**High risk**
Nepal Demographic and Health Survey 2001 (2002)	Cross-sectional study **High risk**	Recall **High risk**	Recall **High risk**	GA: 7 or more months **Low risk**	During age 0-6 days **Low risk**	Within 7-30 days of life **Low risk**	SB def: Low risk END def: Low risk Overall risk: **Low risk**	**High risk**

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Study	Ascertainment of pregnancy	Ascertainment of birth	Ascertainment of death	Definitions of all mortality outcomes measured by the study				Overall risk-of-bias
				Definition of stillbirth	Definition of early neonatal death	Definition of late neonatal death	Definition of perinatal death	
Nepal Demographic and Health Survey 2006 (2007)	Cross-sectional study **High risk**	Recall **High risk**	Recall **High risk**	GA: 7 or more months **Low risk**	During age 0-6 days **Low risk**	Within 7-30 days of life **Low risk**	SB def: Low risk END def: Low risk Overall risk: **Low risk**	**High risk**
Nepal Demographic and Health Survey 2011 (2012)	Cross-sectional study **High risk**	Recall **High risk**	Recall **High risk**	GA: 7 or more months **Low risk**	During age 0-6 days **Low risk**	Within 7-30 days of life **Low risk**	SB def: Low risk END def: Low risk Overall risk: **Low risk**	**High risk**
Pakistan Demographic and Health Survey 2006-2007 (2008)	Cross-sectional study **High risk**	Recall **High risk**	Recall **High risk**	GA: after 7 months **Low risk**	Within the first 7 days of life. **Low risk**	Within 7-30 days of life **Low risk**	SB def: Low risk END def: Low risk Overall risk: **Low risk**	**High risk**
Sri Lanka Demographic and Health Survey 2006-2007 (2009)	Cross-sectional study **High risk**	Recall **High risk**	Recall **High risk**	GA: 7 or more months **Low risk**	During age 0-6 days **Low risk**	Within 7-30 days of life **Low risk**	SB def: Low risk END def: Low risk Overall risk: **Low risk**	**High risk**

*GA- gestational age†SB Def:Stillbirth definition ‡END Def: Early neonatal death definition

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Figure 47: Forest plot showing stillbirth rates in eligible studies from Bangladesh according to risk-of-bias of the studies

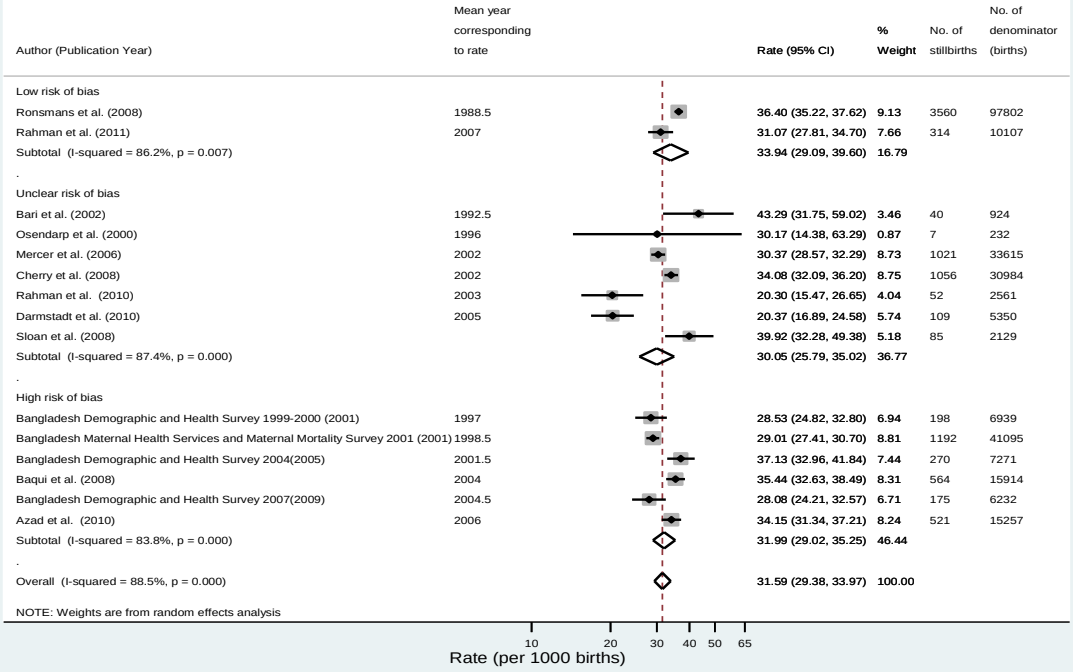
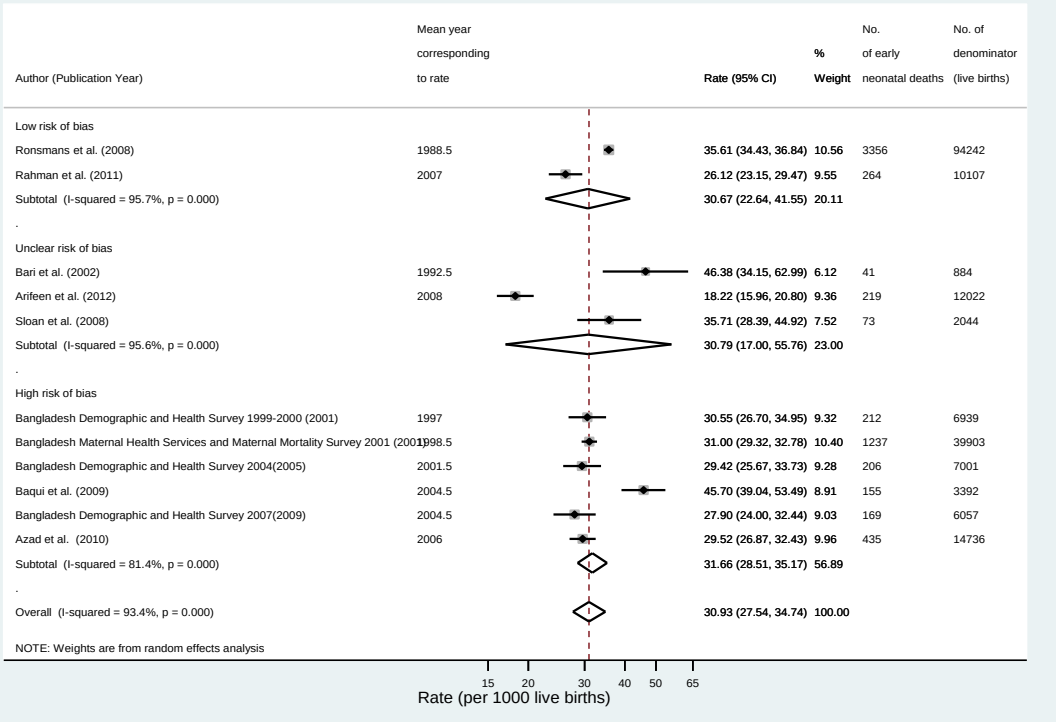


Figure 47: Forest plot showing stillbirth rates in eligible studies from Bangladesh according to risk-of-bias of the studies

Figure 48: Forest plot showing early neonatal death rates in eligible studies from Bangladesh according to risk-of-bias of the studies.



risk-of-bias of the studies.Figure 50: Forest plot showing perinatal death rates in eligible studies from Bangladesh according to risk-of-bias of the studies.

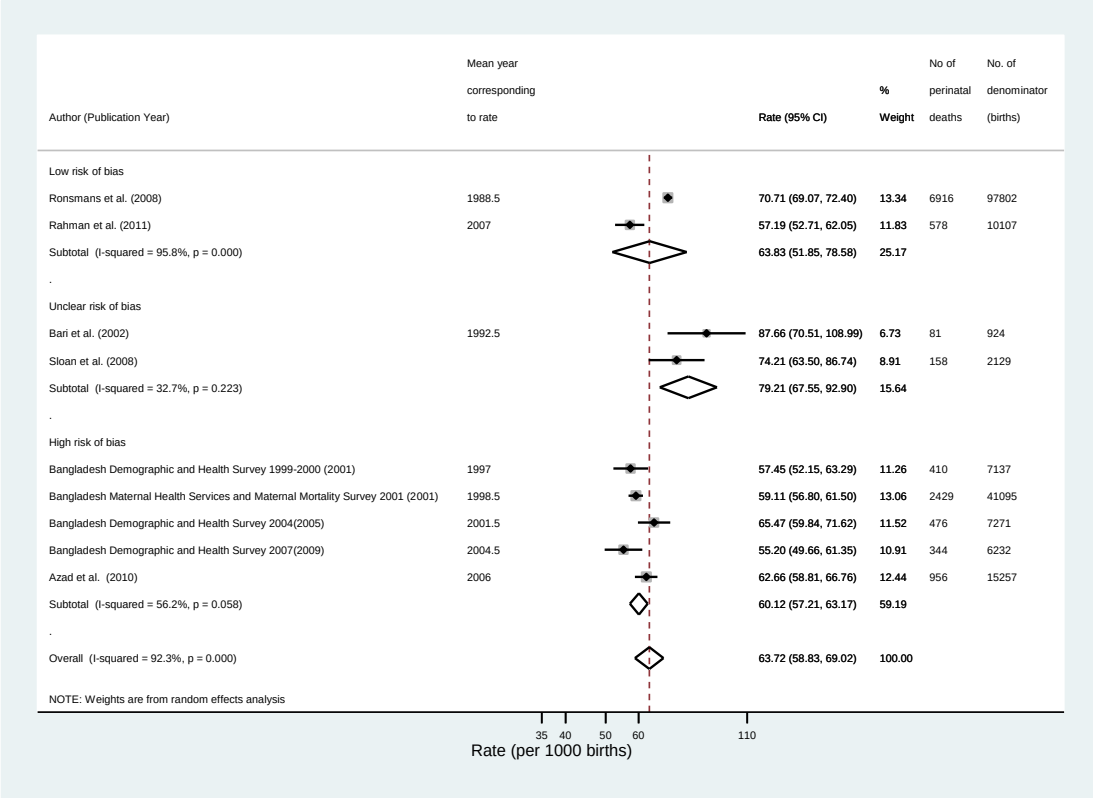


Figure 50: Forest plot showing perinatal death rates in eligible studies from Bangladesh according to risk-of-bias of the studies.

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Figure 51: Forest plot showing stillbirth rates in eligible studies from India according to risk-of-bias of the studies

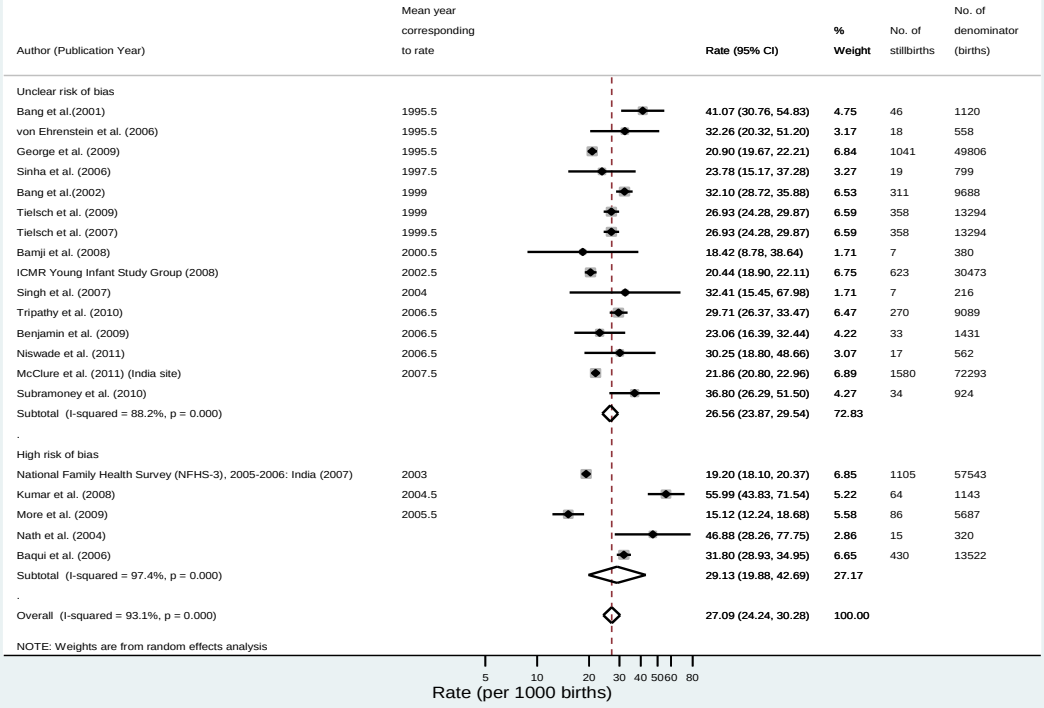

Figure 51: Forest plot showing stillbirth rates in eligible studies from India according to risk-of-bias of the studies

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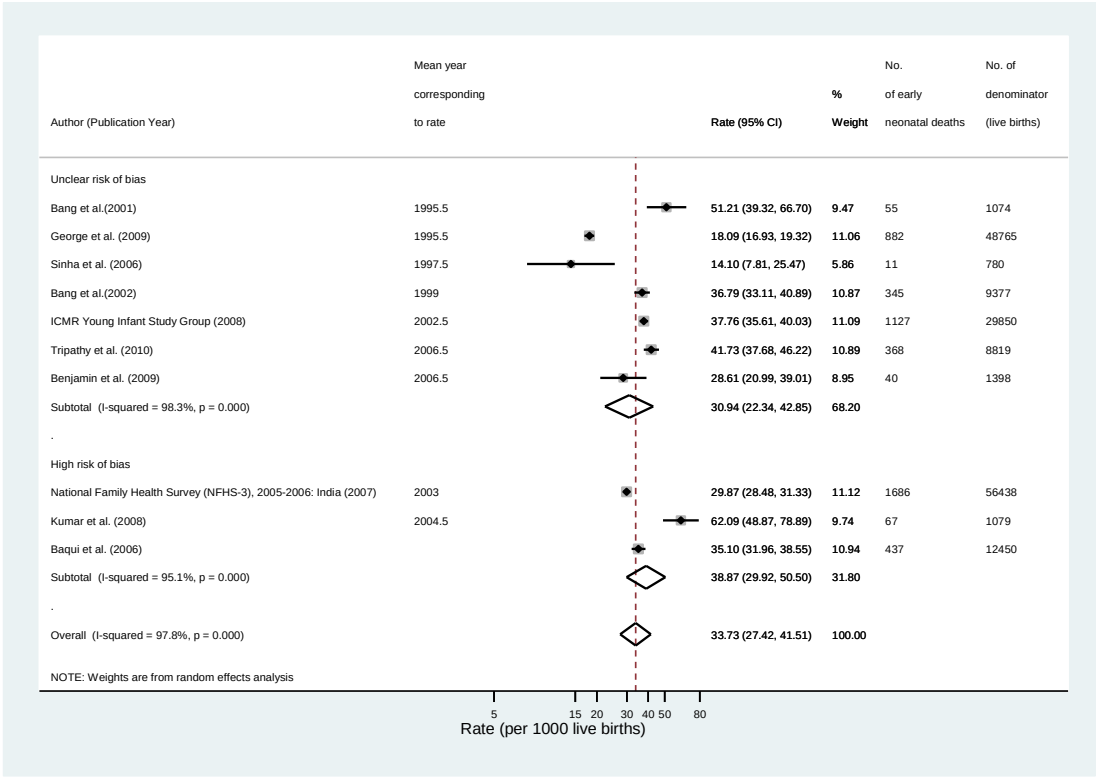

Figure 52: Forest plot showing early neonatal death rates in eligible studies from India according to risk-of-bias of the studies

Figure 53: Forest plot showing

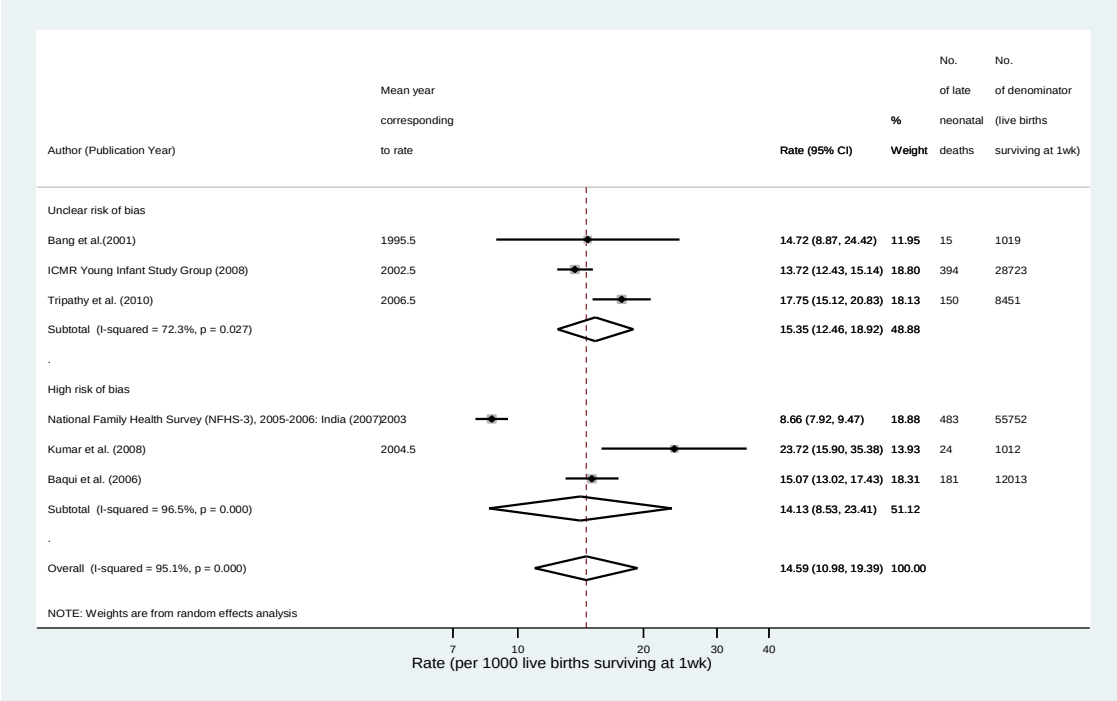

Figure 53: Forest plot showing late neonatal death rates in eligible studies from India according to risk-of-bias of the studies.

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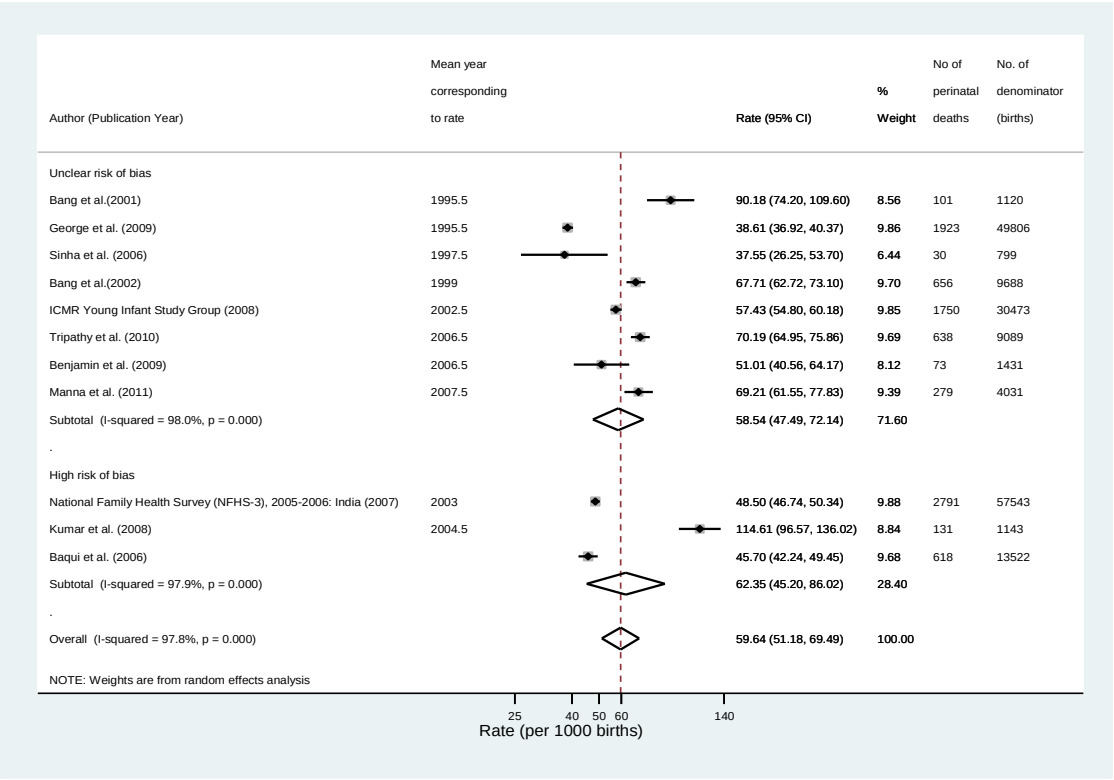

Figure 54: Forest plot showing perinatal death rates in eligible studies from India according to risk-of-bias of the studies.

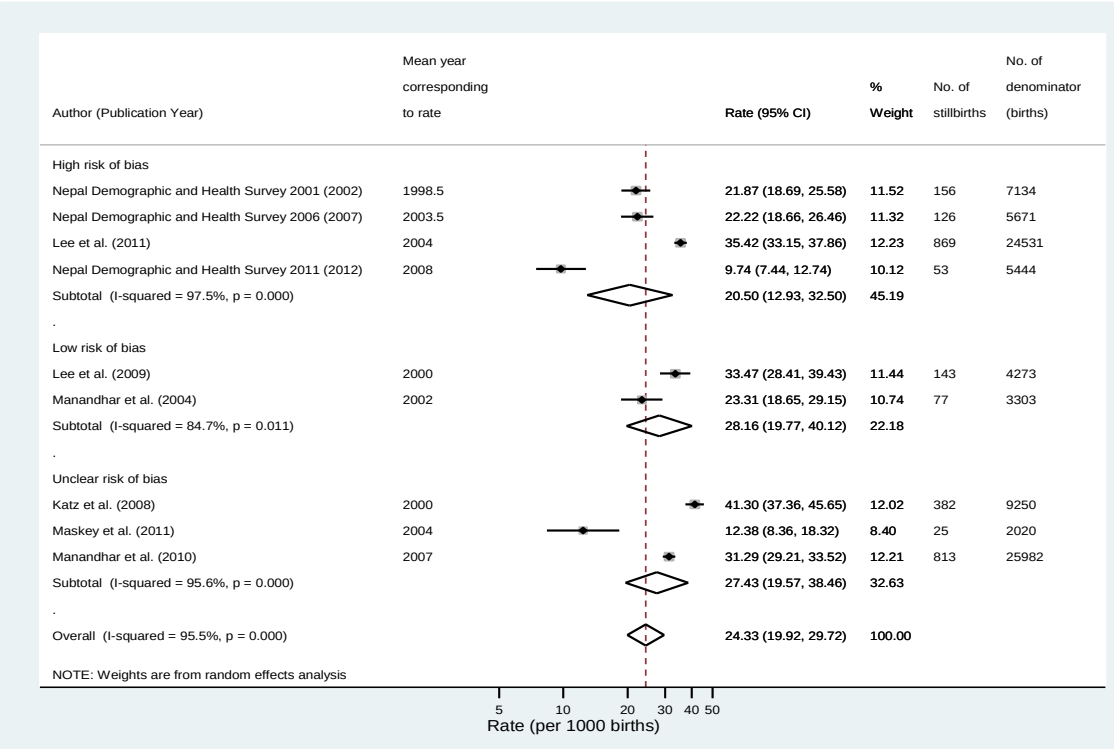

Figure 56: Forest plot showing

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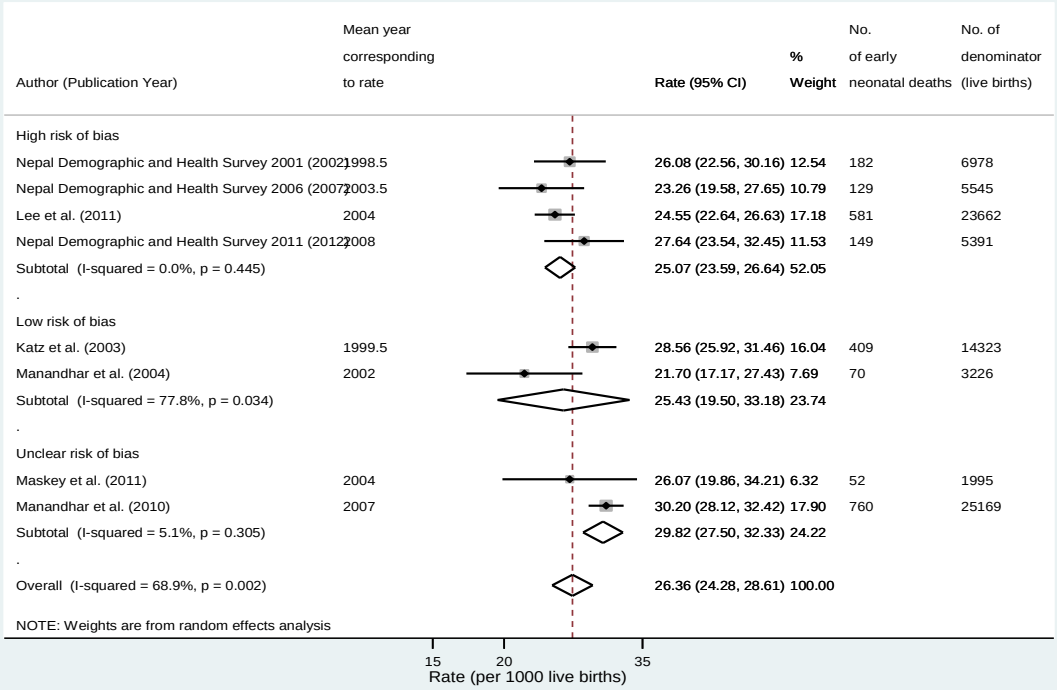

early neonatal death rates in eligible studies from Nepal according to risk-of-bias of the studies

Figure 57: Forest plot showing late neonatal death rates in eligible studies from Nepal according to risk-of-bias of the studies.Figure 58: Forest plot showing

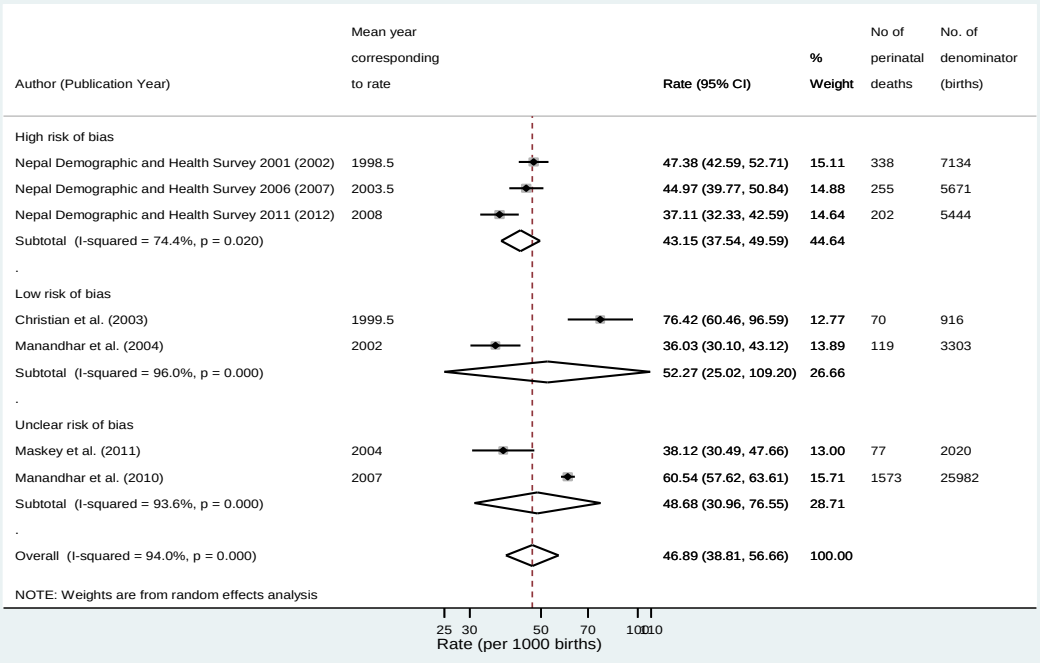

Figure 58: Forest plot showing perinatal death rates in eligible studies from Nepal according to risk-of-bias of the studies.

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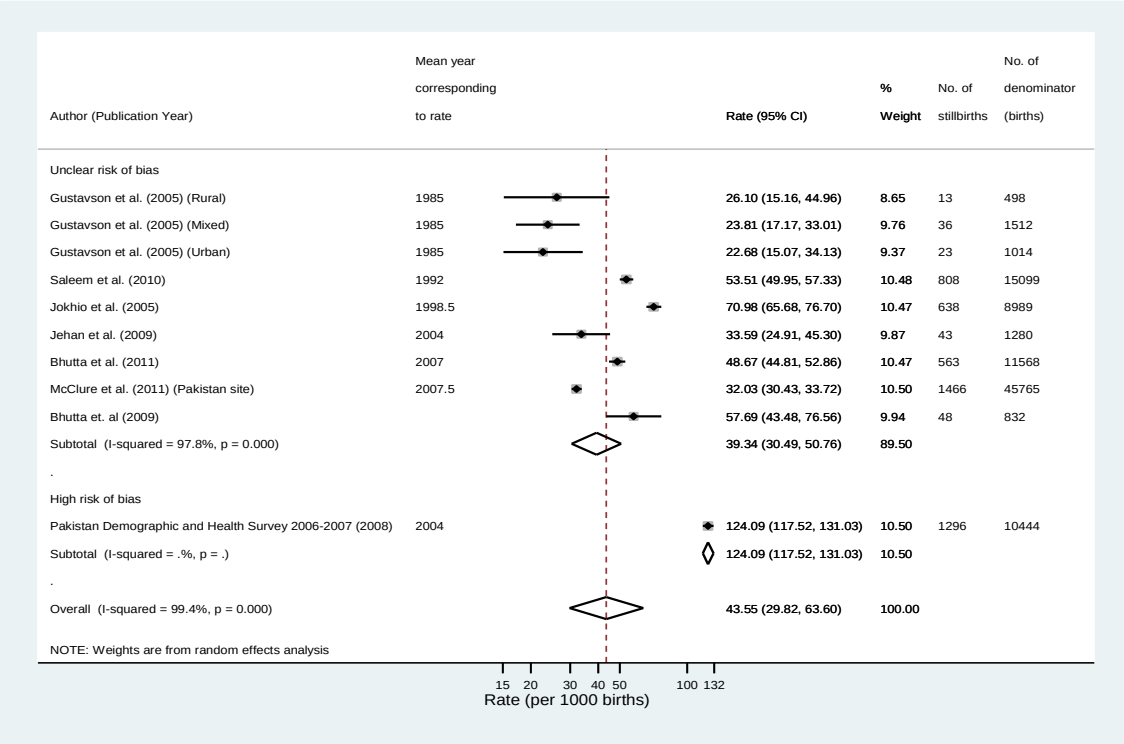
Figure 59: Forest plot showing



stillbirth rates in eligible studies from Pakistan according to risk-of-bias of the studies.

Figure 60: Forest plot showing

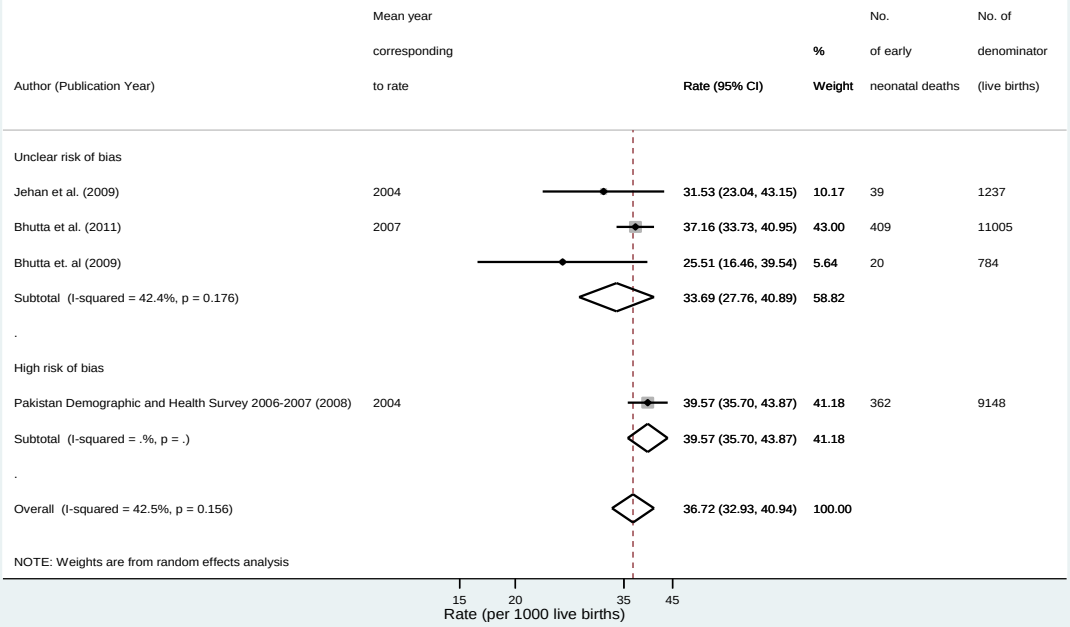


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Figure 60: Forest plot showing early neonatal rates in eligible studies from Pakistan according to risk-of-bias of the studies

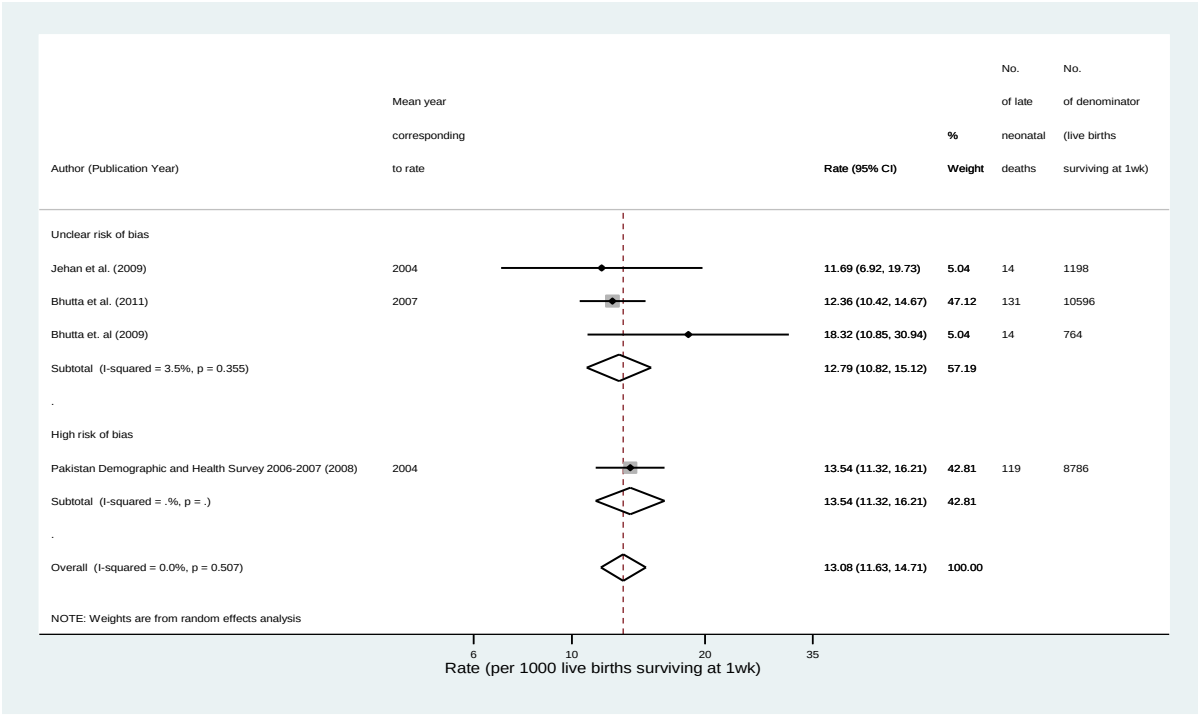

Figure 61: Forest plot showing late neonatal rates in eligible studies from Pakistan according to risk-of-bias of the studies.

Figure 62: Forest plot showing

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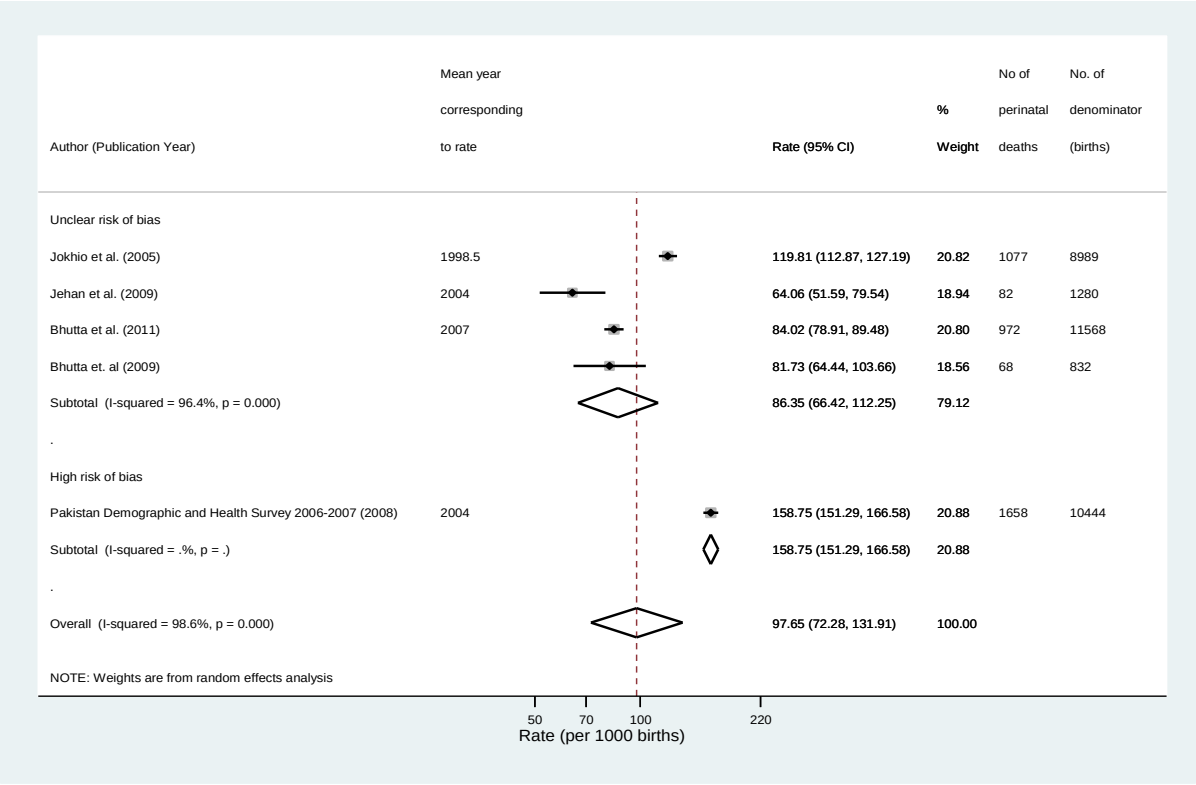

Figure 62: Forest plot showing perinatal death rates in eligible studies from Pakistan according to risk-of-bias of the studies.

Figure 63: Forest plot showing

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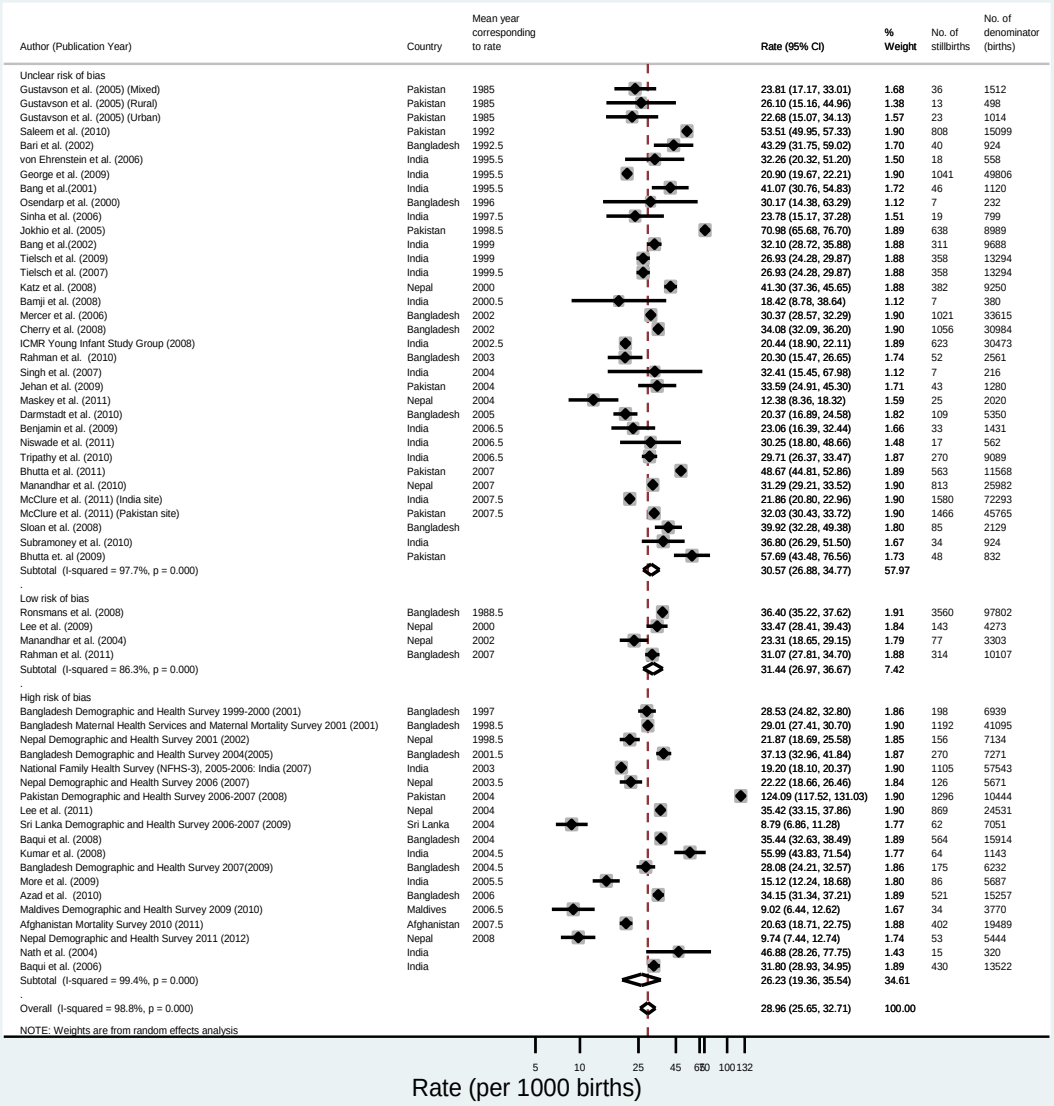

Figure 63: Forest plot showing stillbirth rates in eligible studies from South Asia according to risk-of-bias of the studies.

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Figure 64: Forest plot showing

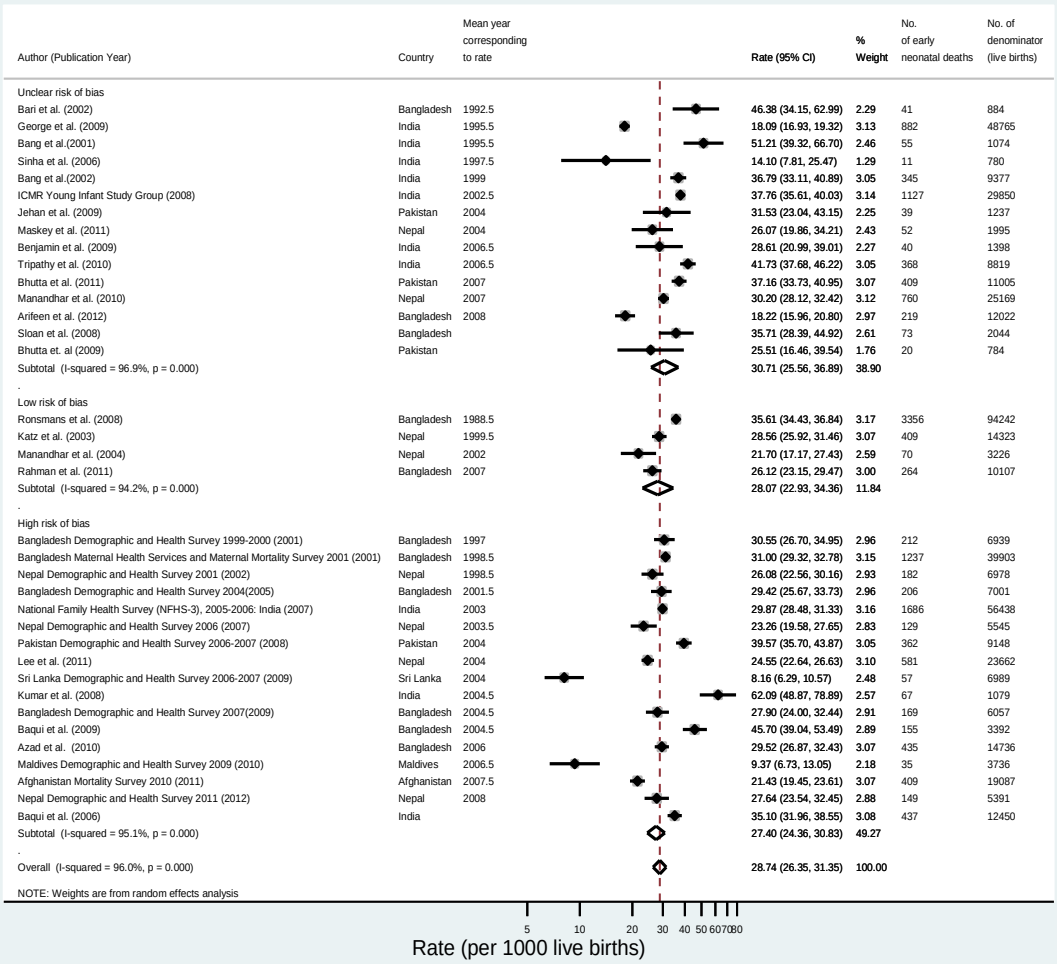

Figure 64: Forest plot showing early neonatal death rates in eligible studies from South Asia according to risk-of-bias of the studies.

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Figure 65: Forest plot showing

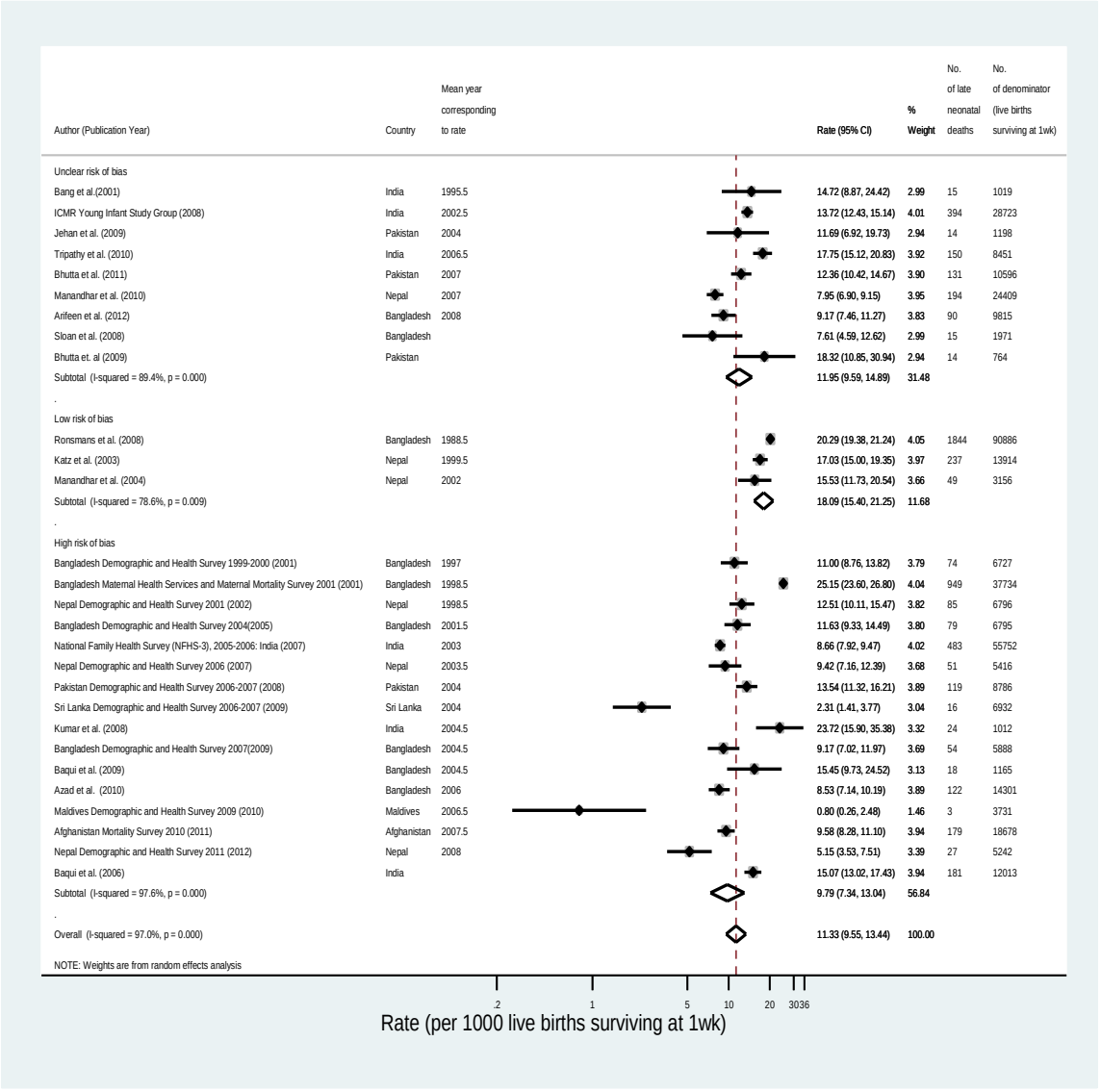

Figure 65: Forest plot showing late neonatal death rates in eligible studies from South Asia according to risk-of-bias of the studies

Figure 66: Forest plot showing perinatal

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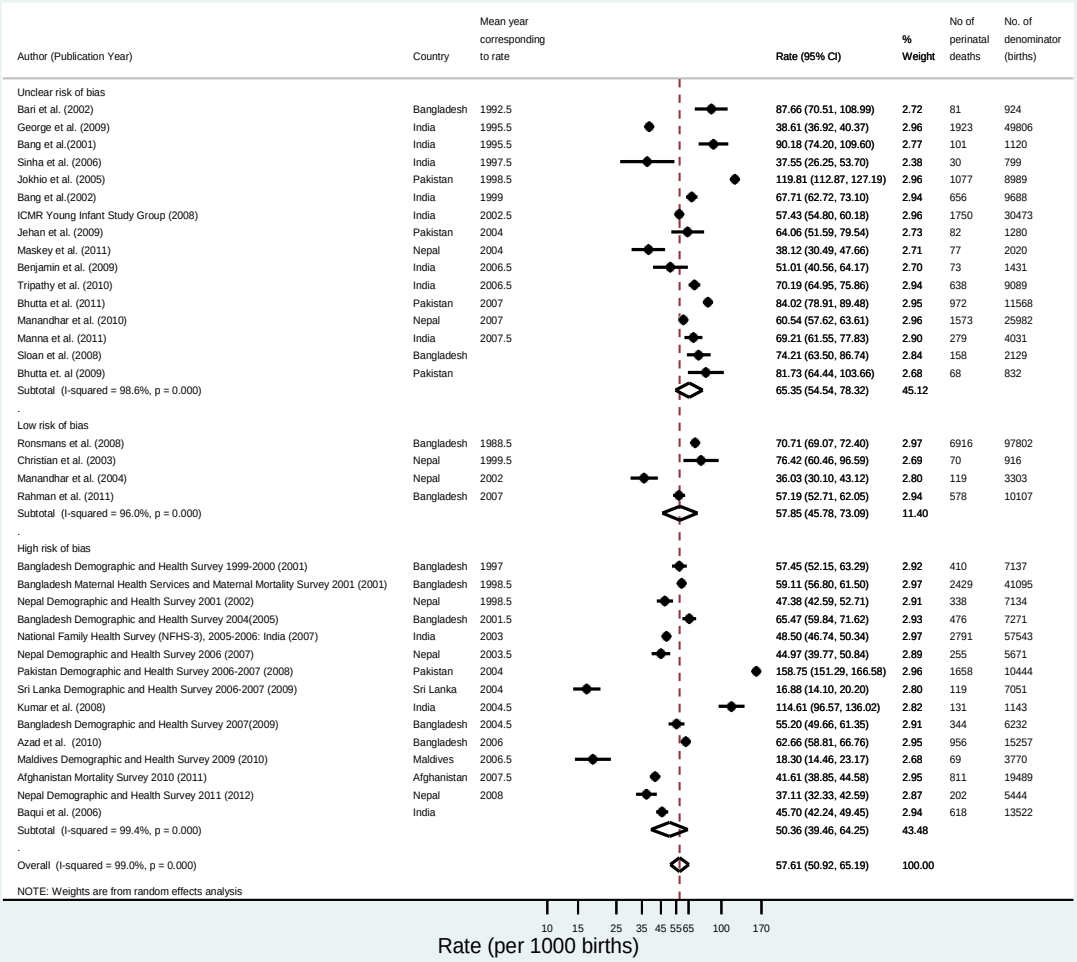

Figure 66: Forest plot showing perinatal death rates in eligible studies from South Asia according to risk-of-bias of the studies

End of Appendix I (Chapter 3: Systematic Review for South Asia)

Appendix II (Chapter 4: The Matlab Safe Motherhood Programme)

(In relation to Chapter 4, section 4.3.4)

Government Family Planning Services in Bangladesh and Matlab:

In 1975, as part of the national policy for population control, the Bangladesh government employed and trained thousands of full-time female field workers, Family Welfare Assistants (FWAs), to perform household visits to distribute contraceptives and provide family-planning referrals for other methods (Bangladesh Ministry of Health and Family Welfare 2010). Since 1989, each Family Welfare Assistant has been visiting each household once every two months. A Family Welfare Assistant provides services to 4,000 people living in the households of her catchment area. In Matlab, contraceptives and family planning counselling are also provided from 10 government fixed-site *Union*-level (sub-sub-district) Health and Family Welfare Centres(Razzaque & Streatfield 1998), each of which provides services to 20,000-30,000 people (Mridha et al. 2009) as well as 24 government monthly outreach satellite clinics (M. Rahman et al. 2009). While abortions are illegal in Bangladesh, early pregnancy terminations within eight weeks of conception are permitted with the husband's consent by 'menstrual regulation' (MR) or 'manual vacuum aspiration'(Chowdhury & Moni 2004). This process, in which the products of pregnancy are aspirated from the uterus by a vacuum pump, has been provided by the government since 1978 by trained female paramedics at government health centres in both areas (M. Rahman et al. 2009).

ICDDR,B Family Planning Services in Matlab:

In 1978, family-planning services were intensified in the ICDDR,B service area. Female community health workers provided family planning counselling and contraceptives (injectable contraceptives, oral contraceptive pills and condoms) to households. This door-to door provision of contraceptives resulted in a difference in access to contraceptives in the two areas which contributed to the significant reduction in fertility levels from the late 1970s onwards till the early 2000s in the ICDDR,B service area compared to the Government service area.

In 1987 four fixed site health centres known as 'sub-centres' were established in the ICDDR,B service area. After 2001, door-to-door provision of family planning counselling and contraceptives was discontinued and health and family-planning services were provided from the sub-centres in the ICDDR,B service area (M. Rahman et al. 2009). At the sub-centres,

paramedics insert intrauterine contraceptive devices, administer injectable contraceptives and also perform menstrual regulation (M. Rahman et al. 2009).

Table 1: Contents of the antenatal care (ANC) package of the Matlab Safe Motherhood Programme showing services unchanged (normal font) strengthened (italic) and newly added (bold and italic) from mid-2007 (Source: Pervin, J. et al., 2012)*

Table 1 Contents of antenatal care (ANC) package in icddr,b area, Matlab, Bangladesh

Topics	Activities* by ANC visits (1st visit: gestation week (GW) 15–19; 2nd visit: GW 24; 3rd visit: GW 32; 4th visit: GW 36)
Rapport building	*Establish rapport with pregnant women*
History taking	Current and past pregnancy, history of chronic disease, contraceptive use, and family history
Clinical Examination	
	Maintain infection prevention measures (all visits)
General	
	Height
	Weight
	Anemia
	Edema
	Blood pressure
Abdominal	
	Fundal height (2nd, 3rd and 4th visits)
	Fetal heart sound (2nd, 3rd and 4th visits)
	Fetal position and presentation (3rd and 4th visits)
Vaginal	(restricted unless physician decides)
Share findings	***Share the clinical findings with mother and support person***
Ultrasound examination	
	Identify last menstrual period date (1st visit)
	Fetal growth (all visits)
	Early diagnosis of twin (1st visit)
	Any congenital malformation (1st and 2nd visit)
	Placental position (2nd , 3rd and 4th)
	Amount of liquor (2nd, 3rd and 4th)
	Mal-presentation (3rd and 4th)
Routine Investigations	
	Urine dip-stick **–** albumin and sugar
	Routine and microscopic examination (icddr,b Hospital)
	Blood grouping and hemoglobin estimation (icddr,b Hospital)
Immunization and drugs	
	Immunization against tetanus
	Anti- helminth drug use (2nd visit)
	Iron and folic acid supplementation and ***checking***
Risk factor identification and management	
	Antibiotic use for pre-mature rupture of membrane
	Corticosteroid treatment for women with risk or in preterm labor
	Induction of labor for postdated pregnancy
	Asymptomatic bacteriuria (icddr,b Hospital)
	Anti-D for Rh-negative mother
Tracking	
	Tracking of women with risk factors
Counseling	
	Diet and rest including work sharing and hygiene practice
	Immunization
	Micronutrient supplementation
	Birth preparedness (money, transport, pieces of cloths, delivery place)
	Breast feeding
	Preterm and/or low birth weight
	Immediate newborn care
	Danger signs of newborn and mother
Documentation	*Proper documentation of all services*

*The items belong to column heading 'Activities' are presented by font-weight indicating the changes of interventions over the study period: normal - interventions unchanged; Italic: interventions strengthened; bold and italic: new interventions added.

Appendix II

*Source: Table 1 in "Pervin J, Moran A, Rahman M: Association of antenatal care with facility delivery and perinatal survival: a population-based study in Bangladesh.BMC Pregnancy Childbirth 2012, 12:111".

Table 2: Different services provided by the Matlab Safe Motherhood Programme at stages of pregnancy, delivery and post-delivery showing interventions unchanged (normal font) strengthened (italic) and newly added (bold) from mid-2007. (Source: Rahman et al. 2011)*

Clinical Care: Inpatient	**1. Childbirth Care**		**2. Newborn Baby and Child Care**	**Essential newborn and maternal care training; refresher training; monthly meeting; Management Information System (MIS)**
	Skilled obstetric care at birth *Essential newborn care for neonates (hygiene, warmth, breastfeeding) and resuscitation* *Referral for complications* and blood transfusion for emergency obstetric care **Adherence with infection prevention protocol**		Emergency care Case management of neonatal and childhood illnesses **Kangaroo mother care for preterm and /or low birth weight (LBW) babies** **Adherence with infection prevention protocol**	
	3. Antenatal Care		**4. Postnatal Care**	
	Four focused visits integrated with risk tracking and its management **Routine ultra-sonogram** Tetanus immunization and **de-worming** *Referral to next level for complication*		*Promotion of healthy behaviors for mother and newborn* **Early detection and referral of complications** **Extra visits for preterm babies**	
Family / or Community Care	**5. Pregnancy Care**		**6. Postnatal and Child Care**	
	Home-based life saving skills for pregnant women and their support person **Pregnancy home visit at 12-14 weeks & 32-34 weeks** *Recognition of danger signs, Supporting referral system* *Community dissemination/community leaders orientation meeting* *Emergency transport* Iron- folate supplementation *Distribution of delivery kit* **Risk tracking** and counseling Tetanus immunization		**Post pregnancy home visits at 0, 3, 7 and 28 days** Healthy home behaviors including: **exclusive breastfeeding, care of cord and skin, extra care for preterm and/or LBW babies** **Promotion of demand for facility-based care, recognition of danger signs, and care-seeking**	

*Source: Figure 4.1 in "A Rahman, A Moran, J Pervin et al. Effectiveness of an integrated approach to reduce perinatal mortality: recent experiences from Matlab, Bangladesh. BMC Public Health, 11 (2011), p. 914"

Appendix II

Table 3: Perinatal death rates for the ICDDR,B and Government service areas in Matlab (1987-2009)

Year	Stillbirth (No.)	Early neonatal death (No.)	Perinatal death (No.)	Total births (Stillbirths+Livebirths) (No.)	Perinatal death rate (per 1000 births)
ICDDR, B service area					
1987	121	91	212	3,277	64.69
1988	115	86	201	3,024	66.47
1989	82	80	162	2,816	57.53
1990	101	89	190	2,847	66.74
1991	89	75	164	2,571	63.79
1992	83	90	173	2,536	68.22
1993	89	72	161	2,540	63.39
1994	86	64	150	2,648	56.65
1995	70	49	119	2,578	46.16
1996	79	64	143	2,327	61.45
1997	81	58	139	2,479	56.07
1998	72	69	141	2,733	51.59
1999	74	54	128	2,580	49.61
2000	91	61	152	2,689	56.53
2001	101	53	154	2,903	53.05
2002	82	75	157	2,869	54.72
2003	60	71	131	2,952	44.38
2004	75	61	136	2,775	49.01
2005	71	53	124	2,633	47.09
2006	76	49	125	2,634	47.46
2007	62	42	104	2,567	40.51
2008	52	33	85	2,651	32.06
2009	39	28	67	2,442	27.44
1987-2009	**1851**	**1467**	**3318**	**62,071**	**53.45**
Government service area					
1987	170	122	292	4,125	70.79
1988	121	141	262	4,239	61.81
1989	115	113	228	3,850	59.22
1990	135	123	258	4,006	64.40
1991	131	123	254	3,514	72.28
1992	131	109	240	3,395	70.69
1993	145	129	274	3,236	84.67
1994	137	111	248	3,256	76.17
1995	123	104	227	3,096	73.32
1996	86	86	172	2,963	58.05
1997	111	101	212	3,014	70.34

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1998	118	85	203	3,234	62.77
1999	127	83	210	3,027	69.38
2000	90	102	192	3,170	60.57
2001	98	89	187	3,097	60.38
2002	102	80	182	2,909	62.56
2003	123	74	197	2,920	67.47
2004	100	71	171	2,860	59.79
2005	78	73	151	2,643	57.13
2006	85	58	143	2,580	55.43
2007	96	57	153	2,599	58.87
2008	79	52	131	2,463	53.19
2009	72	60	132	2,284	57.79
1987-2009	**2573**	**2146**	**4719**	**72,480**	**65.11**

Table 4.4: Loss to follow-up through out-migration for women of all ages during 1987-2009.

Year	Mid-year female population	In-Migration (women)	Out-migration	Overall out migration/ loss to follow-up	Out-Migration per 1000 females
1987	98134	3620	4616	996	10.15
1988	99209	2629	4246	1617	16.30
1989	100481	2565	4639	2074	20.64
1990	101558	3022	4523	1501	14.78
1991	102572	3163	4596	1433	13.97
1992	102997	3784	4943	1159	11.25
1993	104167	2876	3785	909	8.73
1994	104871	3784	4943	1159	11.05
1995	105751	3081	3860	779	7.37
1996	106990	2982	3530	548	5.12
1997	108406	3968	4413	445	4.10
1998	109679	3436	4015	579	5.28
1999	111012	3954	4743	789	7.11
2000	112209	4131	5048	917	8.17
2001	113417	3873	5046	1173	10.34
2002	114861	5118	5482	364	3.17
2003	116385	4734	5708	974	8.37
2004	117037	4950	6305	1355	11.58
2005	117693	4372	6014	1642	13.95
2006	118026	5198	6207	1009	8.55
2007	118413	4768	6486	1718	14.51
2008	118639	5138	6746	1608	13.55
2009	119500	6231	6487	256	2.14
All years	**2522007**	**91377**	**116381**	**25004**	**9.91**

End of Appendix II (Chapter 4: Matlab Safe Motherhood Programme)

Appendix III (Chapter 5: Matlab Preterm Births)

Table 1: Distribution of preterm births in Matlab (2005-2009)

Birth	Gestational age group (weeks)	Number (n)	Percentage (%)
Extremely preterm	22-27	115	2.98
Very preterm	28-31	431	11.18
Moderate preterm	32-33	667	17.3
Late preterm	34-36	2,642	68.53
Total	22-36	3,855	100

Table 2: Rates for stillbirths, early neonatal deaths and late neonatal deaths according to each gestational age group at birth in 25,038 births, 24, 339 live births and 23, 849 babies alive at Day 7 in Matlab (2005-2009)

	Stillbirth rate			Early neonatal death rate			Late neonatal death rate		
Gestational age (weeks)	No. of deaths	No. of births	Rate per 1000 births	No. of deaths	No. of live births	Rate per 1000 live births	No. of deaths	No. of babies alive at Day 7	Rate per 1000 babies alive at Day 7
25-27	13	88	147.7	34	75	453.3	4	41	97.6
28-31	54	431	125.3	73	377	193.6	11	304	36.2
32-33	61	667	91.5	26	606	42.9	12	580	20.7
34-36	119	2642	45.0	62	2523	24.6	17	2461	6.9
37-41	378	19105	19.8	247	18727	13.2	46	18480	2.5
42-45	74	2078	35.6	42	2004	21.0	3	1962	1.5
All	**699**	**25011**	**27.9**	**484**	**24312**	**19.9**	**93**	**23828**	**3.9**

Appendix III

Table 3: Rates for Day 0 deaths, Day 1 to 2 deaths and Day 3 to 6 deaths according to each gestational age group at birth in 24, 339 live births, 24117 babies alive at Day 1 and 23932 babies alive at Day 3 in Matlab (2005-2009)

	Day 0 death rate			Day 1 to 2 death rate			Day 3 to 6 death rate		
Gestational age (weeks)	No. of deaths	No. of live births	Rate per 1000 live births	No. of deaths	No. of babies alive at Day 1	Rate per 1000 babies alive at Day 1	No. of deaths	No. of babies alive at Day 3	Rate per 1000 babies alive at Day 3
25-27	20	75	266.7	8	55	145.5	6	47	127.7
28-31	34	377	90.2	30	343	87.5	9	313	28.8
32-33	15	606	24.8	6	591	10.2	5	585	8.5
34-36	30	2523	11.9	19	2493	7.6	13	2474	5.3
37-41	103	18727	5.5	102	18624	5.5	42	18522	2.3
42-45	17	2004	8.5	18	1987	9.1	7	1969	3.6
All	**219**	**24312**	**9.0**	**183**	**24093**	**7.6**	**82.00**	**23910**	**3.4**

Table 4: Loss to follow-up through out-migration for women of all ages during 2005-2009.

Year	Mid-year female population	In-Migration (female)	Out-migration (female)	Overall out migration/ loss to follow-up (female)	Out-Migration per 1000 females
2005	117693	4372	6014	1642	13.95
2006	118026	5198	6207	1009	8.55
2007	118413	4768	6486	1718	14.51
2008	118639	5138	6746	1608	13.55
2009	119500	6231	6487	256	2.14
All years	592271	25707	31940	6233	10.52

End of Appendix III (Chapter 5: Matlab Preterm Births)

Appendix IV (Chapter 6: Intrapartum Complications in Matlab and Chandpur)

CODEPLAN OF FORM 2: COMPLICATIONS

Code plan for Hospital Data Extraction (FORM- 2)

Maternal Morbidity Study **Updated by Sushil – 27-01-08**

Variable name	Type	Width	Description	Code values
SLNO	CHAR	(4)	Questionnaires Sl #	4 digits SL#
3. CID	CHAR	(9)	CID of mother	
4. RID	CHAR	(10)	RID of mother	
2. AGE	NUM	(3	Age of the respondent.	Exact age
UNI	CHAR	(30)	Union of the respondent	Not recorded
7.NAME_FACI (Name_Fac)	CHAR	(30)	Name of facility	Not recorded
7. NAME_FA_C1 (Name_FA_C)	NUM	(2)	Facility code 1st option	01 = MatlabICDDR,B Hospital 02 = Matlab THC 03 = Chandpur Sadar Hospital 04 = Chandpur MCWC 05 = Central hospital 06 = Al Baraka 07 = Padma clinic 08= City hospital 09 = Metro clinic 10 = General hospital 11 = Royal hospital 12 = NSDP clinic 13 = Ratan Memorial 14 = Crescent hospital 15 = Jumana hospital 16 = Midland hospital 17 = Al-Amin private clinic 18 = Chandpur Medical center 19 = FWV's home 20 = Doctor's Home

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21 = Shamsun Nahar clinic

22 = H & EWC

23 = Other health complex

24 = Other private facility

25 = Unknown

7. NAME_FA_C2 (Name_FA1)	NUM (2)	Facility code 2nd options	
Q101	DATE DD/MM/YYYY	Date of record review	
Q102	CHAR (1)	Record available or not in the Facility?	1= Yes 2=No
Q103	DATE DD/MM/YYYY	Date of admission	
Q104_1 as follows	NUM(3)	Diagnosis (1st option)	ICD 10 codes

Code list for Diagnosis, Indications of C/S, & Final diagnosis of MM study in Matlab		
Diagnosis	**ICD10**	
Incomplete abortion/Spontaneous abortion/abortion	**o03**	**30**
Induced Abortion	**o04**	**40**
Hemorrhage in early pregnancy	**o20**	**200**
Threatened abortion	o20.0	200
Hemorrhage in early pregnancy, unspecified	o20.9	209
Placenta accreta/Malformation of placenta	**o43.1**	**431**
Placenta praevia	**o44**	**440**
Abruption placenta	**o45**	**450**
APH, unspecified	**o46.9**	**469**
Intrapartum Hemorrhage	**o67**	**670**
Rupture uterus during labor	**o71.1**	**711**
Cervical tear	o71.3	713
PPH (post partum hemorrhage)	**o72**	**720**
Retained placenta NOS	o72.0	720
PPH, NOS (hemorrhage following delivery of placenta)	o72.1	721
PPH (post partum hemorrhage) unspecified	o72.9	729
Retained Placenta without hemorrhage	**o73**	**730**
PIH (pregnancy induced hypertension)	**o13**	**130**

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PET	**o14**	**140**	
Eclampsia	**o15**	**150**	
Unspecified maternal hypertension/HTN	**o16**	**160**	
Malpresentation	**o32**	**320**	
Unstable lie	o32.0	320	
Breech presentation	o32.1	321	
Transverse or oblique lie	o32.2	322	
Face, brow or chin presentation	o32.3	323	
Floating head(high head)	o32.4	324	
Compound presentation/ occipitoposterior	o32.6	326	
Malpresentation, unspecified	o32.9	329	
Twin Pregnancy	**o30.0**	**300**	
Disorders of amniotic fluid &membrane	**o41**	**410**	
Polyhydramnios	o40.0	400	
Oligohydramnios	o41.0	410	
Chorioamnionitis	o41.1	411	
Other unspecified disorder of amniotic fluid &membrane (Leaking membrane)	o41.9	419	
Premature rupture of membrane	**o42**	**420**	
Premature delivery	**o60**	**600**	
CPD	**o33**	**330**	
Prolonged labor	**o63**	**630**	
prolong 1st stage	o63.0	630	**630**
prolong2nd stage of labor	o63.1	631	631
Obstructed labor due to mal position & mal presentation of fetus	**o64**	**640**	
Obstructed labor due to breech presentation	o64.1	641	
Obstructed labor due to face presentation	o64.2	642	
Obstructed labor due to brow presentation	o64.3	643	
Obstructed labor due to shoulder presentation	o64.4	644	
Obstructed labor due to compound presentation	o64.5	645	
Obstructed labor due to other mal position & mal presentation	o64.8	648	
Obstructed labor due to mal position & mal presentation, unspecified	o64.9	649	
Obstructed labor due to maternal pelvic abnormality	**o65**	**650**	
Other obstructed labor	**o66**	**660**	
Obstructed labor due to unusually large fetus	o66.2	662	
Obstructed labor due to other abnormalities of fetus	o66.3	663	
Failed trial of labor, unspecified	o66.4	664	
Obstructed labor, unspecified	o66.9	669	
Post dated/post term	**o48**	**480**	

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Fetal distress	**o68**	**680**
Fetal distress due to meconium in amniotic fluid	o68.1	681
Cord complication	**o69**	**690**
Cord prolapse	o69.0	690
Cord around the neck	o69.1	691
Cervical tear	**o71.3**	**713**
Perineal tear	**o70**	**700**
1st degree	o70.0	700
2nd degree	o70.1	701
3rd degree	o70.2	702
4th degree (complete tear)	o70.3	703
Perineal tear, unspecified (Laceration)	o70.9	709
Single spontaneous delivery	**o80**	**800**
Spontaneous vertex delivery	o80.0	800
Spontaneous breech delivery	o80.1	801
Spontaneous delivery, unspecified	o80.9	809
Single delivery by C/S	**o82**	820
Delivery by elective caesarean section	o82.0	820
Delivery by emergency caesarean section	o82.1	821
Delivery by caesarean hysterectomy	o82.2	822
Delivery by caesarean section, unspecified	o82.9	829
H/O Previous C/S	O34.2	342
Multiple delivery	**o84**	840
Multiple delivery, all spontaneous	o84.0	840
Multiple delivery, all by forceps and vacuum extractor	o84.1	841
Multiple delivery, all by caesarean section	o84.2	842
Other multiple delivery, by combination of methods	o84.8	848
Multiple delivery, unspecified	o84.9	849
Maternal distress during labor & delivery	**o75.0**	**750**
FTP	o75	750
LP	o75	750
Lower abdominal pain	o75	750
Primi	o75	750
Bandl's ring	o75	750
V.V.F	o75	750
IUGR	o75	750
Obstetric shock	o75.1	751
Septicemia during labor	o75.3	753
Intra Uterine Death (IUD)	**o34.6**	**346**

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Abnormalities of forces of labor	**o62**	**620**
Puerperal sepsis	**o85**	**850**
Infection of genitourinary tract	**o23**	**230**
UTI of pregnancy	**o23.4**	**234**
Genital infection of pregnancy	**o23.5**	**235**
Genitourinary tract infection of pregnancy, NOS	**o23.9**	**239**
Vomiting of pregnancy (hyperemesis)	**o21**	**210**
Complication anesthesia	**o29**	**290**
Ectopic pregnancy	**o00**	**1**
Big baby	**o36.6**	**366**
Respiratory Failure		
Acute respiratory failure	**J96.0**	**960**
Chronic respiratory failure	**J96.1**	**961**
Respiratory failure, unspecified	**J96.9**	**969**

Q104_2	NUM(3)	Diagnosis (2nd option)	-DO-
Q104_3	NUM(3)	Diagnosis (3rd option)	-DO-
Q104_4	NUM(3)	Diagnosis (4th option)	-DO-
Q104_5	NUM(3)	Diagnosis (5th option)	-DO-
Q104_t1	CHAR(80)	Diagnosis (Text) (1st option)	Narrative diagnosis (Text) Up to 80 characters
Q104_t2	CHAR(80)	Diagnosis (Text) (2nd option)	-DO-
Q104_t3	CHAR(80)	Diagnosis (Text) (3rd option)	-DO-
Q104_t4	CHAR(80)	Diagnosis (Text) (4th option)	-DO-
Q104_t5	CHAR(80)	Diagnosis (Text) (5th option)	-DO-
Q105 pregnancy	CHAR (1)	Time of admission in relation To pregnancy. Complications to pregnancy (ectopic, molar pregnancy)	1 = Early 2 = Abortion complications (up to 22 weeks of Pregnancy) 3= Third trimester before labour

			4 = During labour or delivery 5 = Post-partum 9 = Not recorded
Q201	NUM(1)	Delivered in this facility?	1=Yes 2= No
Q202	DATE DD/MM/YYYY	Date of delivery	
	Q203	NUM (1)	Number of Fetus 1= Single 2= Twin 3= Triplet 8= Not applicable 9= Not recorded
Q204	NUM (1)	Result of 1st pregnancy outcome	1 = Live birth 2 = Still birth 8 = Not applicable 9 = Not recorded
Q204_1	NUM(1)	Result of 2nd pregnancy outcome	Same as Q204
Q204_2	NUM(1)	Result of 3rd pregnancy outcome	Same as Q204
Q205	NUM (1)	Mode of delivery for 1st birth	1 = Normal vaginal delivery 2 = NVD with episiotomy 3 = Forceps delivery 4 = Vacuum extraction

			5 = CS 9 = Not recorded
Q205 _1	NUM (1)	Mode of delivery for 2nd birth	Same as Q205
Q205 _2	NUM (1)	Mode of delivery for 3rd birth	Same as Q205
Q206	NUM(2)	Presentation of 1st baby	01 = Cephalic 02 = Breech 03 = Face 04 = Brow 05 = Occipito posterior 06 = Footling 07 = Shoulder 08 = Oblique lie 09 = Compound Presentation 99 = Not recorded
Q206_1	NUM (2)	Presentation of 2nd baby	Same as Q206
Q206 _2	NUM (2)	Presentation of 3rd baby	Same as Q206
Q301	NUM (1)	Undergone any of the surgical Intervention in relation to child birth or early pregnancy loss?	1 = Yes 2 = No 9 = Not recorded
Q302_1	NUM (2)	Name of surgery (1st option)	01=Emergency CS, 02=Elective C/S 03=Hysterectomy

			04=Hysterotomy 05=Laparotomy 06=Craniotomy 07=Symphysiotomy 08=Others
Q302_2	NUM (2)	Name of surgery (2nd option)	Same as Q302_1
Q302_c1	NUM(3)	Indication of surgery(1st option)	ICD 10 codes as Q104_1
Q302_c2	NUM(3)	Indication (2nd option)	-DO-
Q302_c3	NUM(3)	Indication (3rd option)	-DO-
Q302_c4	NUM(3)	Indication (4th option)	-DO-
Q302_c5	NUM(3)	Indication (4th option)	-DO-
Q302_t1	CHAR (80)	Indication of surgery(1st option)	Narrative indication(text)
Q302_t2	CHAR (80)	Indication of surgery(2nd option)	-DO-
Q302_t3	CHAR (80)	Indication of surgery(3rd option)	-DO-
Q302_t4	CHAR (80)	Indication of surgery(4th option)	-DO-
Q302_t5	CHAR (80)	Indication of surgery(5th option)	-DO-
Q303	NUM (1)	Manual removal of placenta under anesthesia had done?	1 = Yes 2 = No 9 = Not recorded
Q304	DATE DD/MM/YYYY	Date of surgery	
Q401A_H	NUM (3)	Systolic blood pressure (Highest)	Not > 400 mm of Hg
Q401A_L	NUM (3)	Systolic blood pressure (Lowest)	Should be 0
Q401A_9	NUM (3)	Not recorded	999

Q401B_H	NUM (3)	Diastolic blood pressure	Not > 200 mm
of Hg			
		(Highest)	
Q401B_L	NUM (3)	Diastolic blood pressure	Should be 0
		(Lowest)	
Q401B_9	NUM (3)	Not recorded	999
Q402_H	NUM (3)	Pulse rate (Highest)/min	Not > 200
Q402_L	NUM (3)	Pulse rate (Lowest)/min	Should be 0
Q402_9	NUM (3)	Not recorded	999
Q403_H	NUM (5,2)	Body temperature (Highest)	Not > 45º C
Q403_L	NUM (5,2)	Body temperature (Lowest)	Not < 10º C
Q403_9	NUM (2)	Not recorded	99
Q404_L	NUM (5,2)	Hemoglobin level (Lowest)	in gm/dL
Q404_9	NUM (2)	Not recorded	99
Q405	NUM (1)	Proteinuria	1 = Yes 2 = No 9 = Not
recorded			
Q406	NUM (1)	If yes, degree of proteinuria	1 = 1+ 2 = 2++ 3 = 3+++ 4 = >3+++
Q407_H	NUM (5,2)	Random blood sugar	Not > 250
mmol/L			
		(Highest)	3 digits number
Q407_L	NUM (5,2)	Random blood sugar	Not < 30
mmol/L			
		(Lowest)	3 digits
numbers			
Q407_9	NUM (3)	Not recorded	999 = not
recorded			
Q408_OED	NUM (1)	Oedema	1 = Yes
2 = No			

			9 = Not recorded
Q408_BLU	NUM (1)	Blurred vision	1 = Yes 2 = No 9 = Not recorded
Q408_HYP	NUM (1)	Hyper reflexia	1 = Yes 2 = No 9 = Not recorded
Q408_GEN	NUM (1)	Genital Infection	1 = Yes 2 = No 9 = Not recorded
Q408_RAP	NUM(1)	Rapid breathing (30 or more/min)	1 = Yes 2 = No 9 = Not recorded
Q408_ANX	NUM (1)	Anxiousness	1 = Yes 2 = No 9 = Not recorded
Q408_CON	NUM(1)	Confusion/Unconciousness	1 = Yes 2 = No 9 = Not recorded
Q408_SEI	NUM (1)	Seizure	1 = Yes 2 = No 9 = Not recorded
Q408_S_S	NUM (1)	S/S of shock	1 = Yes 2 = No 9 = Not recorded
Q408_SCA	NUM (1)	Scanty urination (<30 mL/hr)	1 = Yes 2 = No 9 = Not recorded

Q408_OTH	NUM (1)	Others, specify	1 = Yes 2 = No 9 = Not recorded
Q409	NUM (1)	Blood transfusion needed?	1 = Yes, No. of units ….. 2 = No 9 = Not recorded
Q410	NUM (1)	Mats used for measurement of amount of blood loss in post-partum?	1 = Yes, No. of mats used. 2 = No 9 = Not recorded
Q501	NUM(1)	Woman had Dystocia?	1 = Yes 2 = No 9 = Not confirmed
Q502	NUM(1)	Woman had Hemorrhage?	1 = Yes 2 = No 9 = Not confirmed
Q503	NUM(1)	Woman had Eclampsia?	1 = Yes 2 = No 9 = Not confirmed
Q504	NUM(1)	Woman had Severe Pre-eclampsia?	1 = Yes 2 = No 9 = Not confirmed
Q505	NUM (1)	Woman had Septic shock and septicaemia?	1 = Yes 2 = No 9 = Not confirmed
Q506	NUM (1)	Woman had Severe anemia?	1 = Yes 2 = No 9 = Not confirmed

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Q601	DATE DD/MM/YYYY	Date of discharge	
Q602	CHAR (1)	Condition of the mother at the time of discharge	1 = Released 2 = Referred 3 = Died 9 = Not recorded
Q603 Q104_1	Number(3)	If died, cause of death	ICD10 codes as
Q603_DSC	CHAR (50)	Cause of death	Narrative to cause up to 50 characters
Q604	CHAR (1)	Place of referral (if reffered)	1 = Chandpur Sadar Hospital 2 = Chandpur MCWC 3 = Chandpur private clinic 4 = Other places
Q605 with Diagnosis on risk Diagnosis	NUM(2)	Final diagnosis of mother at the time of discharge 02 = Discharge on request, ...	01 = Discharge advice, Diagnosis 03 = Discharge bond, 04 = Not applicable
Q605_ICD1 (Q605_ICD)	NUM(3)	Final diagnosis(1st option)	ICD 10 codes
Q605_ICD2 (Q605_I1)	NUM(3)	Final diagnosis (2nd option)	ICD 10 codes
Q605_ICD3 (Q605_I2)	NUM(3)	Final diagnosis (3rd option)	ICD 10 codes
Q605_ICD4	NUM(3)	Final diagnosis (4th option)	ICD 10 codes

(Q605_I3)			
Q605_ICD5	NUM(3)	Final diagnosis (5th option)	ICD 10 codes
(Q605_I4)			
Q605_T1	CHAR(80)	Final diagnosis(1st option)	Text entry (80 char)
Q605_T2	CHAR(80)	Final diagnosis(2nd option)	Text entry (80 char)
Q605_T3	CHAR(80)	Final diagnosis(3rd option)	Text entry (80 char)
Q605_T4	CHAR(80)	Final diagnosis(4th option)	Text entry (80 char)
Q605_T5	CHAR(80)	Final diagnosis(5th option)	Text entry (80 char)
Q606	NUM (2)	Condition of neonate during discharge (1st Baby)	01 = Released 02 = Referred 03 = Died 3rd baby 04 = Admitted into hospital 09 = Not recorded 99 = Not applicable
Q606 _1	NUM (2)	Condition of neonate during discharge (2nd Baby)	-Do-
Q606 _2	NUM (2)	Condition of neonate during discharge (3rd Baby)	-Do-
Q607	DATE DD/MM/YYYY	If died, date of death (1st Neonate)	
Q607_1	DATE DD/MM/YYYY	If died, date of death (2nd t Neonate)	
Q607_2	DATE DD/MM/YYYY	If died, date of death (3rd Neonate)	
Q608 health	NUM (2)	Final diagnosis of neonate	01 = Good

		during discharge (1st baby)	02 = Referred 03 = Died 3rd baby 04 = Admitted into hospital 09 = Not recorded 99 = Not applicable
Q608_1	NUM (2)	Final diagnosis of neonate during discharge (2nd baby)	-Do-
Q608_2	NUM (2)	Final diagnosis of neonate during discharge (3rd baby)	-Do-
Q701	NUM (1)	Has final decision on severity of morbidity condition	1 = Yes 2 = No
Q702	NUM(1)	If no, why?	1 = Referred case 2 = Lack of information recorded at facility 3 = Record not found 4 = Does not fulfill selection criteria 5 = Others
Q703	NUM (1)	Degree of severity of morbidity condition of mother 2 = Other complications	1 = Severe pregnancy complication (exclude) 3 = Normal birth with no complications
Q704	NUM (1)	Has the Baby survived during neonatal period (1st baby)	1=Yes 2=No (add in perinatal

			group) 3=Released before 7 days 8=NA/Not recorded
Q704 _1	NUM (1)	Has the Baby survived during neonatal period (2nd baby)	-Do-
Q704 _2	NUM (1)	Has the Baby survived during neonatal period (3rd baby)	-Do-

End of Appendix IV (Chapter 6: Intrapartum Complications)

Appendix V (Chapter 7: Discussion)

Table 1: Thesis objectives, summarized main findings and location of findings within the thesis

Overall Objective	Specific Objectives	Findings	Where presented
1. To systematically review studies in order to obtain reliable estimates for the rates of stillbirths, early neonatal deaths, late neonatal deaths and perinatal deaths in South Asia	1.1 To obtain summary estimates for the afore-mentioned mortality rates by calculating rates directly from data in published population-based studies for the South Asia region and at national levels for the 8 constituent countries (Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan, Sri Lanka and Maldives)	The systematic review identified 62 eligible studies of which quality-wise, very few studies were at low risk-of-bias (<5 studies per group of studies reporting on each mortality type-e.g. stillbirths). The calculated rates for stillbirths, early neonatal deaths, late neonatal deaths and perinatal deaths are very high in the South Asia region and high for all countries except for Sri Lanka and Maldives.	Chapter 3. Systematic review mortality rates by mortality outcome type (section 3.4.4)
	1.2 To compare the summary estimates obtained in the review with estimates available in the current literature.	Summary estimates of mortality rates obtained from the systematic review were not consistently higher or lower than those in the current literature.	Chapter 3. Summary estimates in review compared to estimates in the literature (section 3.4.7)
	1.3 To obtain the ratio of rates of stillbirths to early neonatal deaths at the regional and national level for each of the eight countries of South Asia and for the whole of South Asia.	Underreporting of stillbirths was evident from the systematic review results but this was within the expected range of underreporting for the region.	Chapter 3. Ratios of stillbirth rate to early neonatal mortality rate (section 3.4.8)
2. To examine the contribution of the Matlab Safe Motherhood Programme to the levels and trends in mortality for stillbirths, early neonatal deaths, early neonatal deaths disaggregated by	2.1 To examine the levels and trends in the rates of stillbirths, early neonatal deaths, early neonatal deaths disaggregated by day since birth and late neonatal deaths in two areas of Matlab, Bangladesh during 1987-2009.	Very high rates for stillbirths (32.7/1000 births), early (27.5 /1000 live births) and late neonatal deaths (10.0/1000 babies alive at Day 7) were seen in Matlab over the last 23 years. During these years, stillbirths, early and late neonatal deaths reduced by 46%, 57% and 81% in the ICDDR,B service area and by 0%, 28% and 79% in the Government service area. Large reductions in deaths on the first day (46%) and on the second and third days (55%) after birth were also seen in this time in the ICDDR,B service area compared to no decline in the Government service area while reductions in fourth to seventh day deaths were similar in both areas (72% and 60%).	Chapter 4. Trends in mortality outcomes (section 4.4.8).

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Overall Objective	Specific Objectives	Findings	Where presented
day since birth and late neonatal deaths in two areas, one with and one without the Programme, in a rural cohort in Matlab, Bangladesh.	2.2 To examine the levels and trends in uptake of delivery care in the two areas of Matlab by: i. Type of birth attendant ii. Place of delivery iii. Mode of delivery	(i)Trained birth attendance (by nurse-midwives and doctors) increased from 0% in 1987 in both areas to 82.6% and 37.8% in the ICDDR,B and Government service areas by 2009. (ii) For 2002-2009 (when place of delivery information was recorded), the uptake in facility deliveries was more in the ICDDR,B service area (32% to 77%) than in the Government service area (10% to 25%) (iii)The majority of births in both areas were by normal vaginal delivery. During 2004-2009, Caesarean sections increased more in the ICDDR,B service area (6.1% to 17.6%) than in the Government service area (3.4% to 11.7%).	Chapter 4. Uptake in Professional Delivery Care (section 4.4.5)
	2.3 To examine the socio-demographic determinants of stillbirths, early neonatal deaths, specific day-wise early neonatal deaths and late neonatal deaths.	Maternal age and gravidity showed U-shaped relationships with both stillbirths and early neonatal mortality while only gravidity showed a similar association in case of late neonatal mortality. Higher levels of education were associated with lower risks of stillbirths, early neonatal deaths and late neonatal deaths while higher levels of wealth reduced risks for early and late neonatal deaths. Mortality risks for Day 0 and Day 1-2 deaths were reduced only by the highest levels of wealth which had no effect on Day 3-6 deaths.	Chapter 4. Trends in mortality outcomes (section 4.4.8)
	2.4 To examine if there are any differences in mortality rates over time in the two areas and if so, whether the differences are explained by the socio-demographic changes taking place in Matlab over the study period .	Stillbirths and very early (Day 0 and Day 1-2 deaths) neonatal deaths declined significantly and faster annually in the ICDDR,B area (2%, 2% and 3%) than in the Government service area (0%, 0% and 1%).The declines seen in the ICDDR,B and Government service areas for Day 3-6 deaths (6% vs. 4%) and late neonatal deaths (6% vs. 7%) was much steeper compared to stillbirths and very early neonatal deaths but there was no difference between the two areas. The results did not change after demographic and socio-economic factors changes were taken into consideration. This suggests that the Safe Motherhood Programme may have contributed to the decline of stillbirths and very early neonatal deaths.	Chapter 4. Time Trends by Area (section 4.4.9)
3. The overall objective is to examine the contribution of preterm births to stillbirths and neonatal deaths in a rural cohort in Matlab, Bangladesh during 2005-2009.	3.1 To examine the distribution of gestational age at birth and the distribution of preterm births in a rural cohort in Matlab, Bangladesh.	Gestational ages ranged from 22 to 45 weeks' pregnancy in Matlab with the mean and median gestational age of 39.4 and 39.0 weeks. Preterm births constituted 15.5% of all births between 2005-2009 in Matlab. Late and moderate preterm births constituted 68.7% and 17.3% of preterm births.	Chapter 5. Description of study sample and Prevalence of preterm births (Sections 5.4.1 and 5.4.2)

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Overall Objective	Specific Objectives	Findings	Where presented
	3.2 To examine the socio-demographic determinants of preterm births in Matlab.	Odds of preterm births were lower: (i) in the ICDDR,B service area compared to the Government service area (ii) for higher levels of education (iii) for lower levels of poverty (iv) for women <30 years old and for (v) low gravidity. Preterm births declined over time in both areas of Matlab only after 2008.	Chapter 5. Association between socio-demographic characteristics and preterm births (Section 5.4.4)
	3.3 To examine the association between gestational age and stillbirths, early neonatal deaths, specific day-wise early neonatal deaths and late neonatal deaths.	Odds of mortality were the highest for all types of mortality outcomes at the lowest gestational age (22-27 weeks) and the lowest at term (37-41 weeks). Of all mortality outcomes, Day 0 deaths had the highest risk of death at 22-27 weeks (OR=53.8)	Chapter 5. Association between gestational age and mortality (Section 5.4.6)
	3.4 To examine if there are any differences in preterm birth rates in the two areas over time and if so, whether the differences are explained by the socio-demographic changes taking place in Matlab over the study period.	There was no difference in the declines seen in both areas from 2008 and socio-demographic differences were not responsible for the reductions observed.	Chapter 5. Association between socio-demographic characteristics and preterm births (Section 5.4.4)
	3.5 To measure the contribution of preterm births to stillbirths, early neonatal deaths, specific day-wise early neonatal deaths and late neonatal deaths by calculating the population attributable risk percentage of preterm births for these mortality outcomes.	Preterm birth was responsible for a third of stillbirths and deaths in the neonatal period. (Stillbirths-29.7%, early neonatal deaths-32.0%, late neonatal deaths-34.0%, Day 0 deaths -37.1%, Day 1 to 2 deaths-23.2% and Day 3 to 6 deaths-31.6%)	Chapter 5. Percentage of mortality outcomes attributable to preterm births in Matlab (Section 5.4.6)
4. To examine the contribution of intrapartum complications to perinatal deaths in a rural cohort in Matlab, Bangladesh.	4.1 To examine perinatal mortality, socio-demographic characteristics and length of gestation by highest level of care accessed in a cohort of women in Matlab, Bangladesh	(i)The lowest and highest perinatal mortality rates were in the ICDDR,B subcentre (21.8 deaths/ 1000 births) and in hospitals beyond Chandpur (88.1/1000 births), respectively. (ii)Women delivering in hospitals beyond Chandpur were the most educated, wealthiest and had the least number of pregnancies while women delivering at home were the poorest, least educated and had the highest number of pregnancies. (iii)Preterm births were more common in women delivering in hospitals beyond Chandpur (21.1%) and in those delivering at home (15.5%) compared to other locations.	Chapter 6. Description of sample (Section 6.4.1)

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Overall Objective	Specific Objectives	Findings	Where presented
	4.2 To examine perinatal mortality, delivery location and socio-demographic characteristics by whether or not data on intrapartum complications are available in women who deliver at health facilities.	Perinatal mortality rates were much higher in births with no available intrapartum complication data (89.8 deaths/ 1000 births) than births with available data (39.4 deaths/ 1000 births) but the difference was statistically non-significant. Data availability for births at the ICDDR,B Matlab hospital (93.9%) and at the Matlab and Chandpur hospitals (88.2%) was similar. Socio-demographic characteristics of mothers of preterm births were not significantly different for births with available or unavailable intrapartum complication data	Chapter 6. Results related to intrapartum complications (Section 6.4.2)
	4.3 To examine the prevalence of intrapartum complications in women delivering at health facilities.	The prevalence of births with any intrapartum complication was 24.3/100 births. The most common intrapartum complication was dystocia (13.2/100 births) followed by anaemia (5.7/100 births) and hypertensive diseases of pregnancy (4.4/100 births)	Chapter 6. Results related to intrapartum complications (Section 6.4.2)
	4.4 To examine the prevalence of intrapartum complications by delivery location, socio-demographic characteristics and preterm gestation in births for which any intrapartum complication was present or absent.	The prevalence of intrapartum complications was significantly higher at Matlab and Chandpur hospitals (49.3/100 births) than at the ICDDR,B Matlab hospital (12.9/100 births).The prevalence of intrapartum complications did not vary by socio-demographic characteristics. Prevalence was higher in preterm births (31.1/100 births) than term births (23.3/100 births) but the difference was non-significant.	Chapter 6. Results related to intrapartum complications (Section 6.4.2)
	4.5 To examine the strength of association between intrapartum complications and perinatal deaths in women delivering at health facilities.	Only two intrapartum complications (haemorrhage and multiple pregnancy) were associated with increases in odds of perinatal mortality (ORs of 6.31 and 3.60, respectively), while dystocia and hypertensive diseases of pregnancy had no effect on mortality.	Chapter 6. Results related to intrapartum complications (Section 6.4.2)

End of Appendix V (Chapter 7: Discussion)

~The End~