

The effectiveness of referral for emergency maternity care in developing countries: A systematic review and meta-analysis



To assess the effects of interventions for emergency obstetric referral in developing countries, focusing on Phase II delays.

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FACTORS **PHASES OF 'PROBLEM' DELAY** **INTERVENTION** **CONSEQUENCES (EFFECTS)**

Socio economic, --> cultural
Phase I
 Deciding to seek care



Quality --> **Phase III**
 Obtaining treatment

Search results

Records from other sources:
Provided by people contacted n=7
From cited references n=126

Records from databases searched:
Medline, Medline in process, Embase, CAB
n=21,260
Central n=417, EPOC n=0, CINAHL n=2679

Records after duplication removed
N=19,484

Abstracts selected
n=618

Excluded (did not
meet criteria)
n=371

Articles
selected after
screening n=5

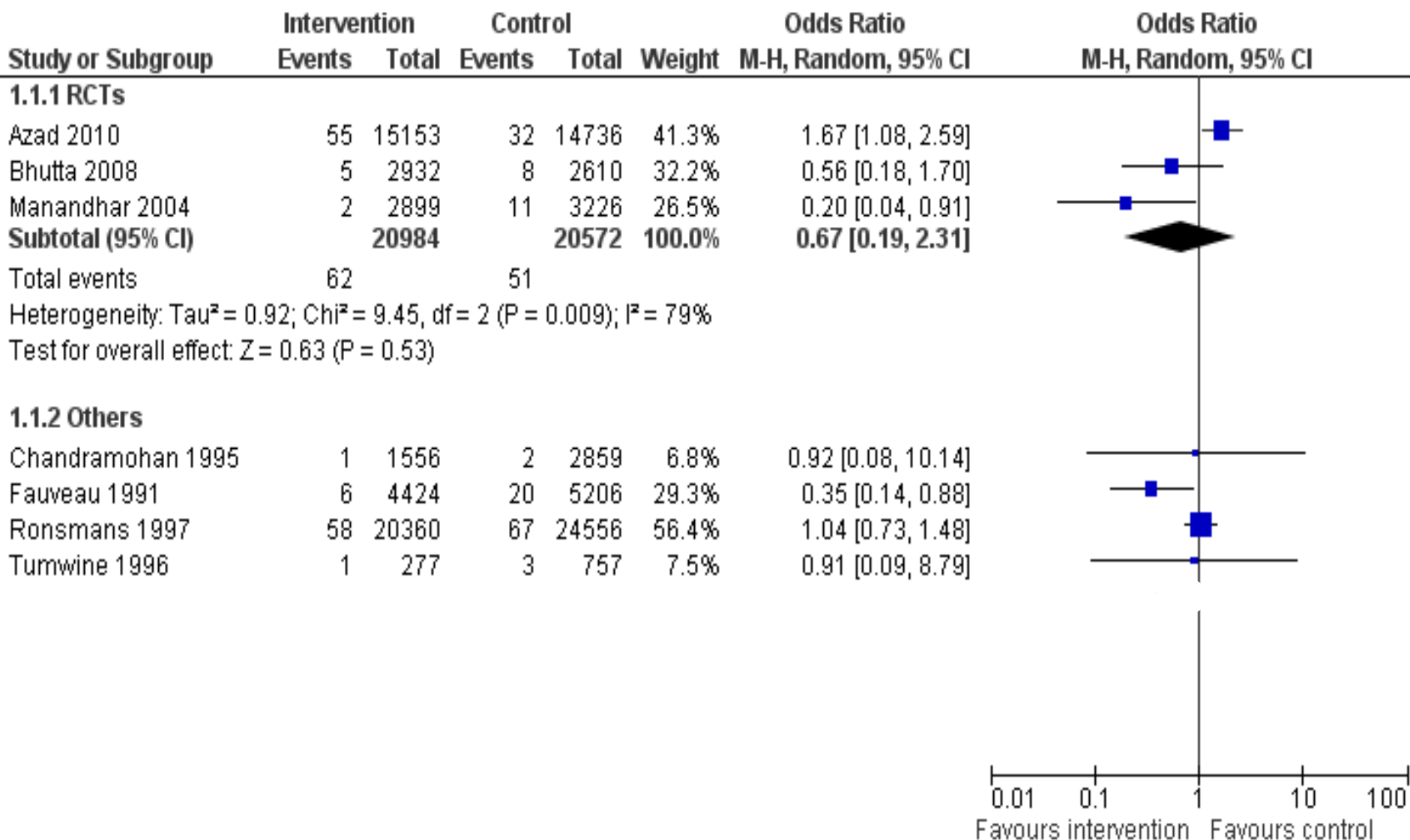
Full articles assessed
n=242

Full articles excluded
because:
R1: No second delay referral
mechanism n=119
R2: No comparison n=63
R3: No relevant outcomes
n=7
R4: Review articles n=34

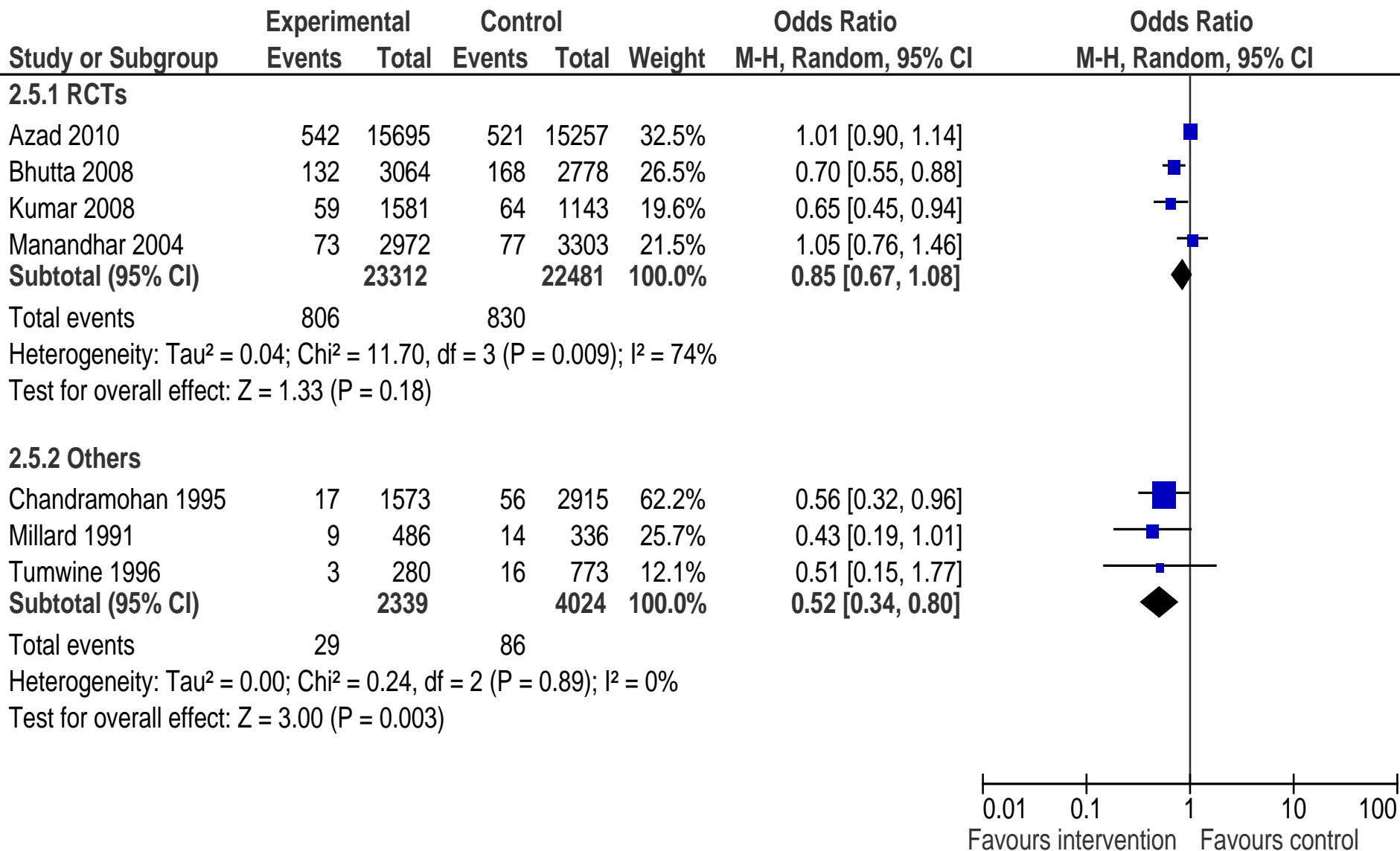
Articles included n=19

Study (setting, design)	Phase II referral intervention	Other intvns
Azad, 2010 Bangladesh (RCT)	<ul style="list-style-type: none"> •Community emergency transport fund •Support to surmount institutional, cost, other barriers 	YES
Bailey, 2002 Guatemala (CBA)		
Bhutta, 2008 Pakistan (RCT)		
Hossain, 2006; Barbey, 2001 (CBA) Bangladesh		
Kumar, 2008 India (RCT)		
Manandhar, 2004 Nepal (RCT)		
Alisjahbana, 1995 Indonesia (COHORT)	<ul style="list-style-type: none"> •Maternity waiting homes •Radios •Various types of ambulances (car, boat, bicycle) 	YES
Brazier, 2009; FCI, 2007 Burkina Faso (CBA)		NO
Chandramohan 1994, 1995 Zimbabwe (COHORT)		
Lungu, 2001 Malawi (CBA)		
Millard, 1991 Zimbabwe (COHORT)		
Tumwine, 1996 Zimbabwe(COHORT)		
van Lonkhuijzen, 2003 Zambia (COHORT)		
Fauveau 1991, Maine 1996, Ronsmans 2007		

Effects: maternal mortality








































































































Effects: stillbirths



Effects: outputs and intermediate outcomes



Indicator	Data available (total 14 studies)	Findings
Knowledge of intervention	3	Inconclusive
Referral rate for complications	4	Higher in intervention arm
Compliance	2	Higher in intervention arm
Travel time/distance	4	Inconclusive
Costs to user	3	Range US\$0.03-9
Satisfaction	0	-
Delivery in health facility	9	3 studies with lower utilisation in intervention arm, others higher
	(3 had data to calculate OR)	2 RCTs: OR 3.35 (CI 2.68,4.20) 1 other: OR 3.24 (CI 1.91,5.50)
Delivery en-route	1	Intervention 1.5%, Control 1.7%
Delivery with professional	5	Similar to health facility deliveries
Met need	1	Inconclusive

Author, year	Selection bias	Study design	Confounders	Blinding	Data collection methods	Withdrawals/dropouts
1. <i>Alisjahbana et al, 1995</i>						
2. <i>Azad et al, 2010</i>						
3. <i>Bailey et al, 2002</i>						
4. <i>Bhutta et al, 2008</i>						
5. <i>Brazier et al 2009 ; FCI, 2007</i>						
6. <i>Chandramohan et al, 1995</i>						
7. <i>Chandramohan et al, 1994</i>						
8. <i>Fauveau et al, 1991</i>						
9. <i>Hossain et al, 2006 ; Barbey et al 2001</i>						
10. <i>Kumar et al, 2008</i>						
11. <i>Lonkhuijzen et al, 2003</i>						
12. <i>Lungu et al, 2001</i>						
13. <i>Maine et al, 1996</i>						
14. <i>Manadhar et al, 2004</i>						
15. <i>Millard et al, 1991</i>						
16. <i>Ronsmans et al, 1997</i>	N/A					
17. <i>Tumwine, J. and Dungare, P. 1996</i>						



What works?

- South Asian studies: community transport funds (with other community mobilisation) reduced neonatal mortality but inconclusive because of multiple intervention components
- Sub Saharan Africa: use of maternity waiting homes may improve stillbirth rates
- Cannot assume the utility of transport and communication modalities

What next?

- Referral system as essential part of the health system
- Stillbirths and maternity waiting homes?....but need more research
- Is the 'right' question:
 - what works? Referral interventions work within a complex 'system'
 - or "how does it work and where?" – so we need research on explanatory mechanisms (e.g. theory of change, logic chains, contribution analysis)

Ideal

- Car ambulance with a health worker to carry every pregnant woman in labour or experiencing a complication
- Transfer times of less than 2hrs to EmONC

Cost effective

- ??