JTM 15-033: Supplementary on line material

Appendix S8: Risk of bias assessment: observational studies

Study	Newcastle-Ottawa scale scores				Specific Limitations noted by author or researcher
	Selection	Comparability	Outcome	Total	
Baker (2009) (Baker, Thornley, Mills, Roberts, & Perera, 2010)	3	0	3	6	Infection possible prior to boarding. Recall bias. Incomplete laboratory testing.
Bell (2014) (Bell, Komylo Duong, Finell, & Slaten, 2014)	1	0	1	2	Mandatory reporting of ILI in crew could lead to higher rates detected than in passengers who self-report. Under-estimation likely on shorter cruises due to incubation time being longer than the cruise.
Breugelman (2004) (Breugelmans, Zucs, Porten, Broll, Niedrig, & Ammon, 2004)	1	0	2	3	Restricted, unrepresentative sample due to difficulties contacting passengers. Infectivity of index case unknown
Brotherton(2003) (case study) (Brotherton, Delpech, Gilbert, Hatzi, Paraskevopoulos, & McAnulty, 2003)	1	0	1	2	Cases had to self-report. Other exposure not excluded
Brotherton (2003) (cohort) (Brotherton, Delpech, Gilbert, Hatzi, Paraskevopoulos, & McAnulty, 2003)	0	0	2	2	Large possibility of recall bias due to late contact of passengers post cruise and self-reporting of symptoms
Brownstein (2006) (Brownstein, Wolfe, & Mandl, 2005)	3	1	3	7	P&I mortality data used as a proxy for influenza prevalence
Catala (2012) (Catala,	2	0	3	5	Outcome relies on reporting symptoms therefore mild symptoms could

Ruis, Garcia de Ololla, Nelson, Alvarez, & Minguell, 2012)					underestimate attack rate.
Christensen (2001) (Christenson, Lldln-Janson, & Kallings, 1987)	1	0	1	2	Relies on self-reporting of symptoms, underestimation likely
Cui (2011) (Cui, et al., 2011)	1	1	1	3	Impossible to contact all persons on the train. Unclear if passenger location on train as no seat allocation. Transmission could have occurred in other places.
Foxwell (2011) (Foxwell, Roberts, Lokuge, & Kelly, 2011)	2	0	2	4	None identified
Han (2009) (Han, Zhu, He, Liu, Zhang, & Ma, Emerging Infectious Diseases)	2	0	1	3	Recall bias. Unclear whether cases were laboratory confirmed
HPA (2013) (Health Protection Agency, 2013)	2	0	2	4	Contact tracing limited to the UK
Khan (2009) (Khan, Arino, Hu, Raposo, Sears, & Calderon, Spread of a novel influenza A(H1N1) virus via global airline transportation, 2009)	3	0	3	6	2008 air travel data used as a proxy for 2009
Kim (2010) (Kim, Lee, Shin, Kang, Kim JS, & Jun, 2010)	3	0	1	4	No statement of follow up time of passengers
Marsden (2003) (Marsden, 2003)	1	0	2	3	Laboratory confirmation not performed

Miller (2000) (Miller, Tam, Maloney, Fukuda, Cox, & Hockin, 2000)	1	0	1	2	Timing of infection not specific to transport as have enquired about ARI up to 3 days prior to travel.
Moser (1979) (Moser, Bender, Margolls, Nobie, Kendal, & Ritter, 1979)	4	0	3	7	Isolated incident due to malfunctioning ventilation, not generalizable.
Neatherlin (2013) (Neatherlin, Cramer, Dubray, & K, 2013)	1	0	1	2	Recall bias. Limited laboratory confirmation due to late investigation
Olsen (2007) (Olsen, 2003)	1	0	2	3	Possible, but unlikely, that infection occurred prior to travel. Laboratory confirmation not performed.
Ooi (2010) (Ooi, Lau, Low, Lin, Wong, & Hibberd, 2010)	0	0	2	2	Low proportion of passengers followed up.
Palmer (2007) (Palmer, Sattenspiel , & Cassidy, 2007)	0	0	2	2	Uses P&I data therefore results could be skewed due to natural high proportions of pneumonia deaths in winter unrelated to pandemic influenza.
Pestre (2012) (Pestre, Morel, Encrenaz, Brunon, Lucht, & Pozzetto, 2012)	3	0	3	6	Passengers travelled within a group, extensive non-transport related contact.
Piso (2011) (Piso, Albrecht, Handschin, & Bassetti, 2011)	1	0	3	4	Other exposure not excluded
Troko (2011) (Troko, Myles, Gibson, Hashim, Enstone, & Kingdon, 2011)	2	2	1	5	ARI is not limited to influenza; other respiratory viruses could be involved. Small study group meant restricted subgroup analysis. Passenger density of transport not taken into consideration.
Vogt (2006) (Vogt, Guerra, Flagg, Ksiazek,	1	0	2	3	Unknown whether index case was infective at this time. 1 person refused to supply blood sample

Lowther, & Arguin, 2006)					
Ward (2013) (Ward, Armstrong, McAnulty, Iwasenko, & Dwyer, 2010)	1	0	2	3	Cases had to self-report. Follow up time not adequate to detect all cases
Wilder-Smith (2003) (Wilder-Smith, Leong, & Villacian, 2003)	1	0	1	2	Passengers required to self-report symptoms, no active surveillance.
Young (2013) (Young, Peabody, Smith, Olowokure, Shankar, & Hoschler, 2014)	2	0	2	4	No statement to the length of follow-up therefore cases could have been missed.
Zhang (2012) (Zhang, Peng, Ou, Zeng, Fontaine, & Liu, 2013)	1	0	3	4	Infection could have occurred anytime from 12hrs prior to 12hrs post travel. Lack of seating information