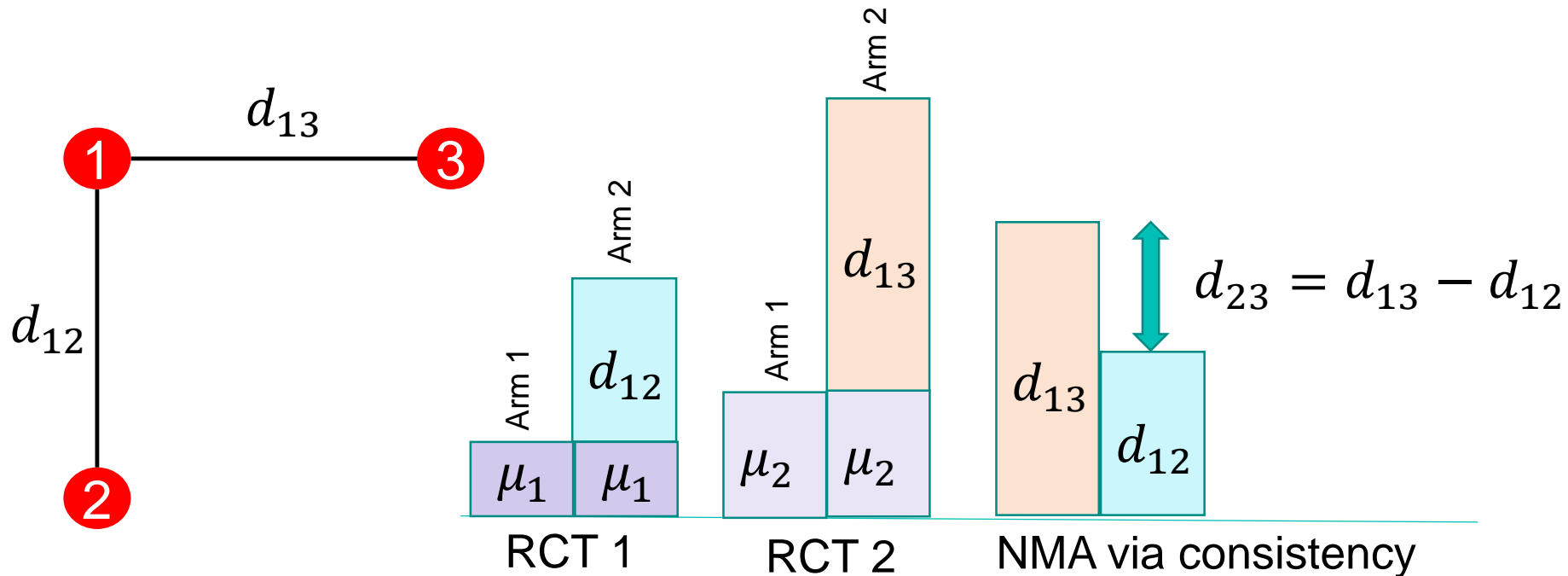


Getting data ready for network meta-analysis

Howard Thom



Network meta-analysis



- A method for indirectly comparing interventions that have not been compared in a head-to-head RCT.
- NMA often conducted in Bayesian framework using OpenBUGS software
- This is linked from R using R2OpenBUGS

The problem

- RCTs going into network meta-analyses are identified by a systematic literature review (SLR).
- Data generated by the SLR is saved in a Data Extraction Sheet (DES).
- DES rarely in the format needed for OpenBUGS NMA code
- We need to write code that converts DES data to OpenBUGS NMA format

The application



Intracavity lavage and wound irrigation for prevention of surgical site infection: systematic review and network meta-analysis

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Paper under review at Surgical Infections

Raw data format

SSI ICL data 20Jan2020 - Excel																										
File Home Insert Draw Page Layout Formulas Data Review View Developer Help																										
J8																										
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T							
Study ID	T1	t1 class	t1 subclass	t2	t2 class	t2 subclass	t3	t3 class	t3 subclass	t4	t4 class	t4 subclass	t5	t5 class	t5 subclass	e1	n1	e2	n2	T						
1 Al-shehri 1994	saline	nonantibac	NA	ampicillin	antibiotic	penicillin											7	134	1	120						
2 Baker 1994	saline	nonantibac	NA	taurolidine	antibiotic/other												17	150	17	150						
3 Carl 2000	saline	nonantibac	NA	cefazolin	antibiotic	cephalosporin											1	20	1	20						
4 Case 1987	saline	nonantibac	NA	tetracycline	antibiotic	other				CHANGE							1	30	0	23						
5 cervantes-sanchez 2	saline	nonantibac	NA	no irrigatio	no irrigatio	NA											11	127	39	156						
6 Cheng 2005	saline	nonantibac	NA	povidone	icantiseptic	NA											7	206	0	208						
7 cho 2004	saline	nonantibac	NA	no irrigatio	no irrigatio	NA											1	17	3	17						
8 Dashow 1986	saline	nonantibac	NA	cephapirin	antibiotic	cephalospo	cefamando	antibiotic	cephalospo	moxolactar	antibiotic	cephalospo	ampicillin	antibiotic	penicillin		3	77	3	70						
9 de jong 1982	no irrigatio	no irrigatio	NA	povidone	icantiseptic	NA											39	279	36	279						
10 elliott 1986	no irrigatio	no irrigatio	NA	cefexitin	antibiotic	cephalosporin											1	78	0	80						
11 greig 1987	saline	nonantibac	NA	cefotetan	antibiotic	cephalosporin											18	65	15	64						
12 Gungorduk 2010	saline	nonantibac	NA	no irrigatio	no irrigatio	NA											17	260	19	260						
13 Halsall 1981	saline	nonantibac	NA	taurolidine	antibiotic/other												29	93	18	99						
14 Hargrove 2006	saline	nonantibac	NA	saline	nonantibac	NA											9	164	30	192						
15 Harrigill 2003	saline	nonantibac	NA	no irrigatio	no irrigatio	NA											1	97	2	99						
16 Kokavec 2008	saline	nonantibac	NA	povidone	icantiseptic	NA											2	73	0	89						
17 Kubota 1999	saline	nonantibac	NA	acidic oxide	antiseptic	NA											4	8	1	8						
18 Kubota 2015	saline	nonantibac	NA	strong acid	antiseptic	NA											4	20	0	24						
19 Levin 1983	saline	nonantibac	NA	cephapirin	antibiotic	cephalospo	cefodoxin	antibiotic	cephalosporin								3	43	0	44						
20 Lord 1983	saline	nonantibac	NA	kanamycin	antibiotic	aminoglycoside											9	100	3	100						
21 Magann 1993	saline	nonantibac	NA	cefazolin	antibiotic	cephalosporin											4	50	2	50						
22 Mahomed 2016	povidone	icantiseptic	NA	no irrigatio	no irrigatio	NA											144	1634	147	1636						
23 mirsharifi 2008	saline	nonantibac	NA	cefazolin	antibiotic	cephalosporin											6	51	6	51						
24 Mohd 2010	povidone	icantiseptic	NA	Dermacyn	antiseptic	NA											14	95	5	95						
25 moylan 1968	saline	nonantibac	NA	kanamycin	antibiotic	aminoglycoside											23	116	12	124						
26 neeff 2016	polyhexani	antiseptic	NA	Ringers soli	nonantibac	NA											19	101	22	96						
27 Nikfarjam	saline	nonantibac	NA	saline	nonantibac	NA											4	66	12	62						
28 Oestreicher 1989	saline	nonantibac	NA	povidone	icantiseptic	NA											15	273	16	267						
29 Oleson 1980	no irrigatio	no irrigatio	NA	ampicillin	antibiotic	penicillin	saline	nonantibac	NA								4	10	3	10						

- Note that this application is cleaner than most!
 - We only need to exclude 'red' studies and the numbers of events and patients don't need to be imputed

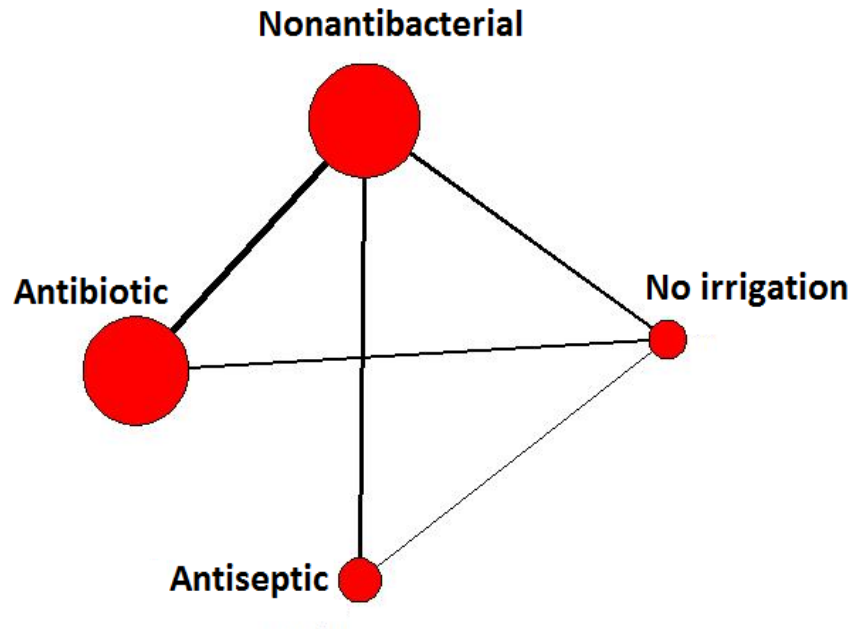
Format needed by ROpenBUGS

- `ns` is the number of studies
- `na[]` is a vector of number of arms for each study
- `t[,]` is a numeric matrix with `ns` rows and `max(na)` columns. Each entry is the treatment in that arm
- `r[,]` is a numeric matrix with `ns` rows and `max(na)` columns. Each entry is the number of events in that arm
- `n[,]` is a numeric matrix with `ns` rows and `max(na)` columns. Each entry is the number of patients in that arm
- Ideally need a mapping from numeric `t[,]` to the actual treatment names

Niggles

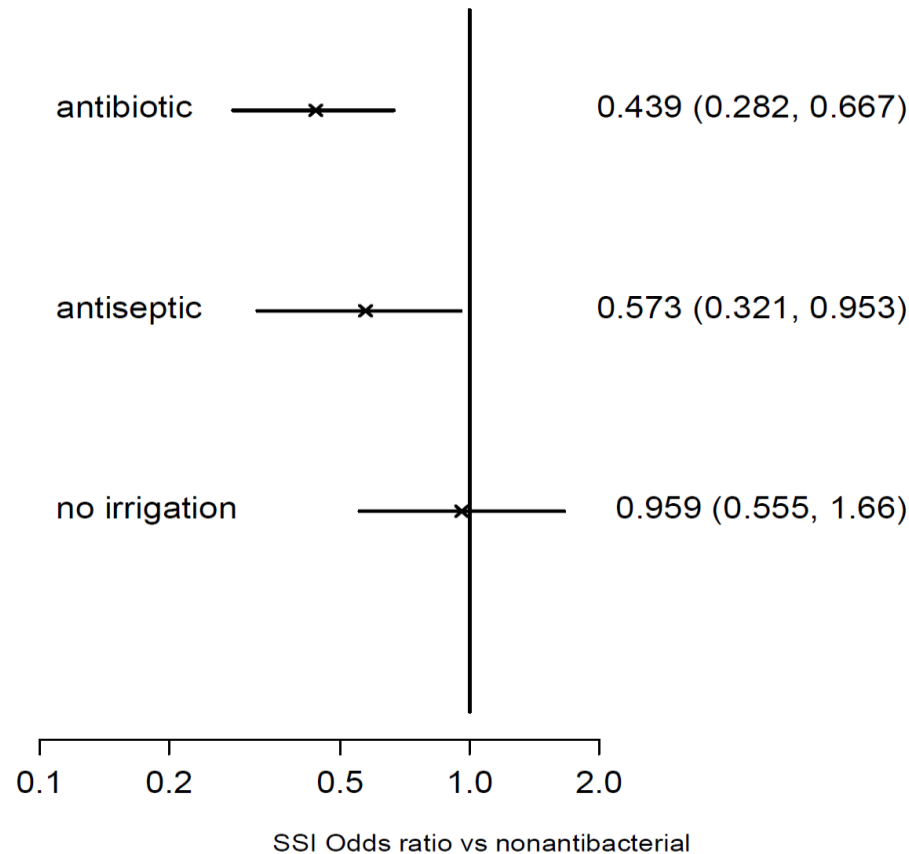
- Treatment numbers need to be in ascending order
- The reference treatment (nonantibacterial irrigation) needs to be 1

Bonus – generate network plot



- Can do this using our formatted data
- Use existing code or write a new function, maybe with ggplot

Super stretch goal – generate forest plot



- This first needs the OpenBUGS code to run

What do we want?

Goal

- Increase efficiency of going from systematic literature reviews to network meta-analyses

Output

- A script that is publicly available on GitHub
- Statisticians can adapt to other situations going forward