

GENERAL INFORMATION-- ONLY BEGIN IF CONSENT GIVEN

Individual barcode	
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00COD	Interviewer's code						
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D D M M Y Y Y Y

01DAT	Date of Interview				
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02STT	Start time				
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03SEX	Gender	F	M
		0	1

HOUSEHOLD QUESTIONS

04AGE	How old are you?	
	Number [99 for don't know, 98 for refused]:	

05LOH	How long have you lived in this household?					
	less than 6 months	6 months to less than 1 year	1 – 4 years	5 – 9 years	10 or more years	Don't know
	0	1	2	3	4	99

06LOC	How long have you lived in [<i>interviewer: say community name</i>]?					
	less than 6 months	6 months to less than 1 year	1 – 4 years	5 – 9 years	10 or more years	Don't know
	0	1	2	3	4	99

07HTI	How many hours did you spend inside your house from midnight yesterday to midnight last night (including sleeping)?					
	less than 5 hrs	5-8	9-13	14-19	more than 20 hrs	Don't know
	0	1	2	3	4	99

08HRE	I want to ask about the people who live in your household. By household I mean those you normally eat with, and who slept in your household since [interviewer: say current time] yesterday. Please do not include yourself.
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Household member	Age (years)	Sex (M/F)	Relationship to you	Key	
				Code	Relationship
HRE1				1	Husband/wife
HRE2				2	Parent
HRE3				3	Child
HRE4				4	Grandparent
HRE5				5	Grandchild
HRE6				6	Brother/sister
HRE7				7	Other(related)
HRE8				8	Other(unrelated)
HRE9				99	Don't know
HRE10				98	Refused
HRE11					
HRE12					
HRE13					
HRE14					
HRE15					
HRE16					
HRE17					
HRE18					

09NKI	[Interviewer: Write down how many children 5-12 years old live in this household]	
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10NSR	How many rooms does your household sleep in?
	Number [99 for don't know, 98 refused] <input style="width: 100px;" type="text"/>

11NWI	How many windows that open (or that are always open) does your household have?
	Number [99 if don't know, 98 refused]: <input style="width: 100px;" type="text"/>

CHILDREN aged 5-12 years

[SKIP TO ACTIVITIES SECTION, 19TVO, IF NO CHILDREN 5-12 YEARS LIVING IN HOUSEHOLD]

I would like to ask you about the children living here. By child, I mean someone aged between 5 and 12 years. You said you had [*interviewer: say number of children aged 5-12 from NKI*] children aged 5-12 years in your household.

12ACS	How many of these [<i>interviewer: say number</i>] children aged 5-12 sleep in the same room with an adult?
	Number [99 for don't know, 98 refused]: <input type="text"/>

13NKS	How many of the children aged 5-12 years old regularly sleep in another household?
	Number [99 for don't know, 98 refused] <input type="text"/>

14SAS	How many of these [<i>interviewer: say number</i>] children aged 5-12 in this household go to school?
	Number [99 for don't know, 98 refused]: <input type="text"/>

15HOT	In the last school holiday how many of the [<i>interviewer: say number</i>] children in your household aged 5-12 (including children not at school) went away and stayed elsewhere for one or more nights?
	Number [99 for don't know, 98 refused]: <input type="text"/> [If zero, skip to 17HGC]

16HOC	How many of the [<i>interviewer: say number</i>] children aged 5-12 stayed outside your community?
	Number [99 for don't know, 98 refused]: <input type="text"/>

17HGC	From midnight yesterday to midnight last night, have children aged 5-12 from a different household come and spent time inside your household?		
	No	Yes	
	0	1	
	[If no, skip to 19TVO]		

18HGH	What was the longest time one of these children stayed inside your household?					
	less than 5 hrs	5-9 hrs	10-14 hrs	15-19 hrs	more than 20 hrs	Don't know
	0	1	2	3	4	99

ACTIVITIES

19TVO	Do you ever watch TV/video in places other than your household?					
		No	Yes			
		0	1			
		[If no, skip to 24MUS]				
20TVF	In the last week, how many times did you watch TV/video in places other than your household?					
	Number (99 for don't know, 98 refused): <input style="width: 100px; height: 20px;" type="text"/>			[no skip]		
21TVL	The last time you did this, how long did you stay there?					
	less than 1 hr	1-2 hrs	3-4 hrs	5-6 hrs	7-9 hrs	More than 10 hrs
	0	1	2	3	4	5
22TVA	The last time you did this, how many other adults and youths (those older than 12) were there?					
0	1-5	6-10	11-15	16-20	21-50	More than 50
0	1	2	3	4	5	6

23TVK	The last time you did this, how many children aged 5-12 were there?					
0	1-5	6-10	11-15	16-20	21-50	More than 50
0	1	2	3	4	5	6

24MUS	Are you a Muslim?		
	No	Yes	
	0	1	

25CHU	Do you go to church? <i>[interviewer: If Muslim, replace 'church' with 'mosque' for this set of questions]</i>		
	No	Yes	
	0	1	
	[If no, skip to 30BAR]		
26CHF	In the last week, how many times did you go to church [a mosque]?		
	Number [99 for don't know, 98 refused]:	<input type="text"/>	[no skip]

27CHL	The last time you went to church [a mosque], how long did you stay there?					
	less than 1 hr	1-2 hrs	3-4 hrs	5-6 hrs	7-9 hrs	More than 10 hrs
	0	1	2	3	4	5

28CHA	The last time you went to church [a mosque], how many adults and youths (those older than 12) were there?					
0	1-5	6-10	11-15	16-20	21-50	More than 50
0	1	2	3	4	5	6

29CHK	The last time you went to church [a mosque], how many children aged 5-12 were there?					
0	1-5	6-10	11-15	16-20	21-50	More than 50
0	1	2	3	4	5	6

30BAR	Do you ever go to bars, discos or shebeens?		
	No	Yes	
	0	1	
	[If no, skip to 35HAI]		
31BAF	In the last week, how many times did you go to a bar, disco or shebeen?		
	Number [99 for don't know, 98 refused]:	<input type="text"/>	[no skip]

32BAL	The last time you were in a bar, disco or shebeen, how long did you stay there?					
	less than 1 hr	1-2 hrs	3-4 hrs	5-6 hrs	7-9 hrs	More than 10 hrs
	0	1	2	3	4	5

33BAA	The last time you were in a bar, disco or shebeen, how many adults and youths (those older than 12) were there?					
0	1-5	6-10	11-15	16-20	21-50	More than 50
0	1	2	3	4	5	6

34BAK	The last time you were in a bar, disco or shebeen, how many children aged 5-12 were there?					
0	1-5	6-10	11-15	16-20	21-50	More than 50
0	1	2	3	4	5	6

35HAI	Do you ever go to a hairdresser or barber?		
	No	Yes	
	0	1	
	[If no, skip to 40SCH]		
36HAF	In the last week, how many times did you go to a hairdresser or barber?		
	Number [99 for don't know, refused 98]:	<input type="text"/>	[no skip]

37HAL	The last time you were in a hairdressers' or barber, how long did you stay there?					
	less than 1 hr	1-2 hrs	3-4 hrs	5-6 hrs	7-9 hrs	More than 10 hrs
	0	1	2	3	4	5
38HAA	The last time you were in a hairdresser or barber, how many adults and youths (those older than 12) were there?					
0	1-5	6-10	11-15	16-20	21-50	More than 50
0	1	2	3	4	5	6
39HAK	The last time you were in a hairdresser or barber, how many children aged 5-12 were there?					
0	1-5	6-10	11-15	16-20	21-50	More than 50
0	1	2	3	4	5	6

40SCH	Do you ever go into school classrooms?		
	No	Yes	
	0	1	
	[If no, skip to 45TAX]		
41SCF	In the last week, how many times did you go into a school classroom?		
	Number [99 for don't know, 98 refused]:	<input type="text"/>	[no skip]

42SCL	The last time you were in a school classroom, how long did you stay there?					
	less than 1 hr	1-2 hrs	3-4 hrs	5-6 hrs	7-9 hrs	More than 10 hrs
	0	1	2	3	4	5
43SCA	The last time you were in a school classroom, how many adults and youths (those older than 12) were there?					
0	1-5	6-10	11-15	16-20	21-50	More than 50
0	1	2	3	4	5	6
44SCK	The last time you were in a school classroom, how many children aged 5-12 were there?					
0	1-5	6-10	11-15	16-20	21-50	More than 50
0	1	2	3	4	5	6

TRAVEL

45TAX	Do you ever use minibuses?
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	No	Yes	
	0	1	
	[If no, skip to 52PEO]		

46TXA	The last time you used a minibus, how many adults and youths (those aged more than 12) were inside the minibus?
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	0-5	6-10	more than 10	
	0	1	2	

47TXK	The last time you used a minibus, how many children aged 5-12 were inside the minibus?
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	0	1-5	more than 5	
	0	1	2	

48TXL	The last time you used a minibus, how long were you inside the minibus?
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	less than 10 mins	10-29 mins	30-59 mins	more than 1 hr	
	0	1	2	3	

49TXF	During the last week, how many times did you use a minibus?
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	Didn't use	1-2	3-6	more than 6	
	0	1	2	3	
	[If 0, skip to 52PEO]				

50TXC	Was anyone coughing on the minibus during the last week?
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	No	Yes	
	0	1	
	[If no, skip to 52PEO]		

51TXB	If so, what things did you and other people on the bus do? [more than one answer OK]			
	Sympathise	0	Open a window	3
	Complain	1	Nothing	4
	Turn away, or cover nose or mouth	2		

YESTERDAY'S CONTACTS

52PEO	<p>I would like to ask you about the people you talked to face-to-face <i>yesterday</i>. We are only interested in the people you had a face-to-face conversation (within arm's reach) with from midnight yesterday to midnight last night. I would like you to include people in your household.</p> <p>First, we will try to remember who they were, and I will write down their name (e.g. "Mary") or a description (e.g. "street vendor") that we can use to refer back to them. We will not keep the names – they only need to be detailed enough to help you remember who you meant. Nicknames or initials are fine. If you met the same person on more than one occasion yesterday, I will record them once, and later we will estimate the total time you spent with them.</p> <p>Think about the morning at home: who did you talk to there? Did you go out? Who did you talk to while you were travelling? Did you go out on business? Think about who you talked to there? Did you go shopping? Did you talk to anyone while shopping? Did you go out in the evening? Who did you talk to then?</p>
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Person name or description (1)	(This is to aid memory and will not be retained.)										
Number		01	02	03	04	05	06	07	08	09	10
What was their age?	0-4yrs	0	0	0	0	0	0	0	0	0	0
	5-12 yrs	1	1	1	1	1	1	1	1	1	1
	13-25 yrs	2	2	2	2	2	2	2	2	2	2
	26-45 yrs	3	3	3	3	3	3	3	3	3	3
	Older than 45 yrs	4	4	4	4	4	4	4	4	4	4
What was their sex?	F	0	0	0	0	0	0	0	0	0	0
	M	1	1	1	1	1	1	1	1	1	1
Do they belong to you:	Household	0	0	0	0	0	0	0	0	0	0
	Workplace	1	1	1	1	1	1	1	1	1	1
	Neither	2	2	2	2	2	2	2	2	2	2
Where were you when you were with them most?	Outside	0	0	0	0	0	0	0	0	0	0
	On transport	1	1	1	1	1	1	1	1	1	1
	Your home	2	2	2	2	2	2	2	2	2	2
	Other home	3	3	3	3	3	3	3	3	3	3
	Shop	4	4	4	4	4	4	4	4	4	4
	Church	5	5	5	5	5	5	5	5	5	5
	Bar/disco/shebeen	6	6	6	6	6	6	6	6	6	6
	School	7	7	7	7	7	7	7	7	7	7
	Clinic/hospital	8	8	8	8	8	8	8	8	8	8
	Hairdresser/barber	9	9	9	9	9	9	9	9	9	9
	Your work building	10	10	10	10	10	10	10	10	10	10
	Other/ don't know	11	11	11	11	11	11	11	11	11	11
What was the total time you were with them during the day?	Less than 5 mins	0	0	0	0	0	0	0	0	0	0
	5-14 mins	1	1	1	1	1	1	1	1	1	1
	15-59 mins	2	2	2	2	2	2	2	2	2	2
	1-4 hrs	3	3	3	3	3	3	3	3	3	3
	5-7 hrs	4	4	4	4	4	4	4	4	4	4
	More than 8 hours	5	5	5	5	5	5	5	5	5	5
Were you inside or outside the community when you were with them most?	Inside	0	0	0	0	0	0	0	0	0	0
	Outside	1	1	1	1	1	1	1	1	1	1
	Both	2	2	2	2	2	2	2	2	2	2
How often do you normally talk to this person?	Never before	0	0	0	0	0	0	0	0	0	0
	Less than monthly	1	1	1	1	1	1	1	1	1	1
	1-3 times a month	2	2	2	2	2	2	2	2	2	2
	1-6 times a week	3	3	3	3	3	3	3	3	3	3
	Daily	4	4	4	4	4	4	4	4	4	4

Person name or description (2)	(This is to aid memory and will not be retained.)										
Number		11	12	13	14	15	16	17	18	19	20
What was their age ?	0-4yrs	0	0	0	0	0	0	0	0	0	0
	5-12 yrs	1	1	1	1	1	1	1	1	1	1
	13-25 yrs	2	2	2	2	2	2	2	2	2	2
	26-45 yrs	3	3	3	3	3	3	3	3	3	3
	Older than 45 yrs	4	4	4	4	4	4	4	4	4	4
What was their sex ?	F	0	0	0	0	0	0	0	0	0	0
	M	1	1	1	1	1	1	1	1	1	1
Do they belong to your:	Household	0	0	0	0	0	0	0	0	0	0
	Workplace	1	1	1	1	1	1	1	1	1	1
	Neither	2	2	2	2	2	2	2	2	2	2
Where were you when you were with them most?	Outside	0	0	0	0	0	0	0	0	0	0
	On transport	1	1	1	1	1	1	1	1	1	1
	Your home	2	2	2	2	2	2	2	2	2	2
	Other home	3	3	3	3	3	3	3	3	3	3
	Shop	4	4	4	4	4	4	4	4	4	4
	Church	5	5	5	5	5	5	5	5	5	5
	Bar/disco/shebeen	6	6	6	6	6	6	6	6	6	6
	School	7	7	7	7	7	7	7	7	7	7
	Clinic/hospital	8	8	8	8	8	8	8	8	8	8
	Hairdresser/barber	9	9	9	9	9	9	9	9	9	9
	Your work building	10	10	10	10	10	10	10	10	10	10
	Other/ don't know	11	11	11	11	11	11	11	11	11	11
What was the total time you were with them during the day?	Less than 5 mins	0	0	0	0	0	0	0	0	0	0
	5-14 mins	1	1	1	1	1	1	1	1	1	1
	15-59 mins	2	2	2	2	2	2	2	2	2	2
	1-4 hrs	3	3	3	3	3	3	3	3	3	3
	5-7 hrs	4	4	4	4	4	4	4	4	4	4
	More than 8 hours	5	5	5	5	5	5	5	5	5	5
Were you inside or outside the community when you were with them most?	Inside	0	0	0	0	0	0	0	0	0	0
	Outside	1	1	1	1	1	1	1	1	1	1
	Both	2	2	2	2	2	2	2	2	2	2
How often do you normally talk to this person?	Never before	0	0	0	0	0	0	0	0	0	0
	Less than monthly	1	1	1	1	1	1	1	1	1	1
	1-3 times a month	2	2	2	2	2	2	2	2	2	2
	1-6 times a week	3	3	3	3	3	3	3	3	3	3
	Daily	4	4	4	4	4	4	4	4	4	4

53PEP	How many extra people, beyond those listed above, do you think you talked to yesterday? [only ask if 20 contacts were listed above, otherwise write 0]		
	Number [0 if all listed above, 99 for don't know, 98 refused]:		

54BUH	Did you leave your home yesterday (i.e. from midnight yesterday to midnight last night)?		
	No	Yes	
	0	1	
	[If no, skip to 56JOB]		

55BUI	<p>I would like to ask you about the buildings you went into yesterday. We are only interested in the buildings that you entered from midnight yesterday to midnight last night. Think about the buildings you entered during the morning (not including your home)? Did you go out on business? What buildings did you go into? Did you go out in the evening? If so, what buildings did you enter?</p>		
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BUILDING NUMBER		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
What type of building did you enter?	Other home	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Shop	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Church	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Bar/disco/shebeen	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	School	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Clinic/hospital	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Hairdresser/barber	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Your work building	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Other	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
How much time did you spend in total inside this building?	Less than 5 mins	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5-10 mins	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	11-59 mins	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	1-4 hrs	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	5-8 hrs	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	9-13	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	More than 14 hrs	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
How many adults and youths (those older than 12) were present?	Less than 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5-9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	10-20	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Greater than 20	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
How many children (5-12) were present?	Less than 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5-9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	10-20	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Greater than 20	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Was this inside your commu-nity ?	Inside	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Outisde	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Did you visit once or more?	Once	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	More than once	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

WORK

56JOB	How have you contributed to household living during the past year? [more than one answer OK]			
	Working on own land	0	Own business	4
	Occasional/seasonal employment	1	Student	5
	Employed	2	Housewife/ home-maker	6
	No contribution	3	Welfare grant	7

57MIN	Have you ever worked in a mine?		
		No	Yes
		0	1

58PRI	This is a personal question which is important for TB transmission. Would you mind telling us if you have you ever been to prison? <i>[interviewer; if necessary reassure them that we are not interested in the reason for their imprisonment]</i>		
		No	Yes
		0	1
			Refused
			98

59AWA	During the last 6 months, how many weeks did you spend away from your household?	
	Number [99 if don't know, 98 refused]:	

ILLNESS/FUNERALS

60FUN	Have you been to a funeral in the past month?		
		No	Yes
		0	1

61HOY	Have you been hospitalized during the last year?		
		No	Yes
		0	1

62HCS	Have you attended a healthcare facility in the last 6 months?		
	No	Yes	
	0	1	
	[If no, skip to 65HCH]		

63HCC	In the last 6 months, have you attended a healthcare facility accompanying a child aged 5-12?		
	No	Yes	
	0	1	

64HCR	In the last 6 months, have you attended a healthcare facility to look after a friend or relative?		
	No	Yes	
	0	1	

65HCH	In the last 6 months, have you sent a child aged 5-12 for any reason to a healthcare facility?		
	No	Yes	
	0	1	

If you have been ill with a cough for more than 5 days, which of the following would you avoid:

		Mark if Avoid
66CAF	Seeing friends?	
67CAT	Using public transport?	
68CAW	Going to work?	
69CAB	Visiting bars, discos or shebeens?	
70CAC	Going to church?	
71CAH	Going to the hairdresser/barber?	
72CAK	Contact with children?	
73CAS	Going into schools?	
74CAM	Going to a clinic?	
75CAV	Watching TV/video or playing games somewhere other than your home?	

In which of the following places do you think children are at risk of catching TB :		Mark for At risk
76RTC	TB corners/TB clinics?	
77RCL	Clinics (other)?	
78RSC	Schools?	
79RMK	Markets/shops?	
80ROH	Other people's households?	
81RHH	Own household?	
82RCH	Churches?	
83RBA	Bars/discos/shebeens?	
84RVC	Games/Video shops, or while watching TV/video somewhere other than at home?	
85RHB	Hairdressers/barbers?	
86RMB	Minibuses?	
87ROC	Outside the community?	

Thank you very much for your time in helping with this survey. Are there any **questions** that you would like to ask?

88ENT	End time				
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	Id number (3 digits)	Date [dd/mm/yyyy]	Signature
Research assistant		[RA leave blank]	
Team leader			
Data entry 1			
Data entry 2			

Web Appendix 2

Supporting Methods: Weighting Methodology

The sampling design used was a two-stage, stratified design. The first stage consisted of a sample of standard enumeration areas (SEAs) from within study communities; the second stage consisted of the selection of individuals from within age and gender strata within the SEA. Differences in the SEA size and the age/gender structures meant all eligible participants did not have an equal likelihood of inclusion in the study.

For this reason, a sample weight was calculated for each interviewee. This reflected the inverse probability of that individual being included in the study because of the sampling design, and was used in conjunction with the `svyset` command in STATA.

The weight was calculated in two stages. A SEA weight was calculated from the probability of an SEA being selected from within a community (i.e. proportional to the number of individuals who consented in the ZAMSTAR final prevalence survey, without replacement). Individual weights were calculated using the number of eligible participants in that interviewee's age and gender stratum within their SEA. The overall weight for each interviewee was a product of both the SEA and individual weights.

Location of contact episodes

The possible locations for close contacts were *'outside', 'on transport', 'own home', 'other home', 'shop', church', 'bar/disco/shebeen', 'school', 'clinic/hospital', 'hairstylist/barber', 'work building' and 'other'*. The possible locations for casual contacts were *'other home', 'shop', 'church', 'bar/disco/sheeban', 'school', 'clinic/hospital', 'hairstylist/barber', 'work building' and 'other'*.

A community was classed as rural if farming was the livelihood of a substantial proportion of people within the catchment area of its main health facility. For this proportion, population density was also often comparatively low and housing type was often decidedly rural.

Web Table 1

Underlying demography used in Equations 1-3

country	gender	age	population
SA	F	18-25	505
SA	F	26-45	622
SA	F	45+	381
SA	M	18-25	401
SA	M	26-45	522
SA	M	45+	271
ZM	F	18-25	904
ZM	F	26-45	944
ZM	F	45+	538
ZM	M	18-25	1004
ZM	M	26-45	1058
ZM	M	45+	470
SA	F	0-4	280
SA	F	5-12	382
SA	F	13-25	739
SA	F	26-45	622
SA	F	45+	381
SA	M	0-4	258
SA	M	5-12	348
SA	M	13-25	590
SA	M	26-45	522
SA	M	45+	271
ZM	F	0-4	668
ZM	F	5-12	1201
ZM	F	13-25	1752
ZM	F	26-45	944
ZM	F	45+	538
ZM	M	0-4	660
ZM	M	5-12	1216
ZM	M	13-25	1728
ZM	M	26-45	1058
ZM	M	45+	470

Web Appendix 3

Sensitivity to different mixing patterns

As close contact counts will not correlate perfectly with effective contact rates, resulting in different patterns and degrees of age-assortativity, we investigate how different levels of assortativity affect our result that adult infection rates are under-estimated by TB infection rates in children.

We consider a simple model for the proportion of contacts for an individual in group α and group i : $p_{\alpha i}$ (the corresponding data are graphed in the main text, Figure 1).

$$p_{\alpha i} = q \cdot \delta_{\alpha, i+2} + \frac{1}{5}(1 - q)$$

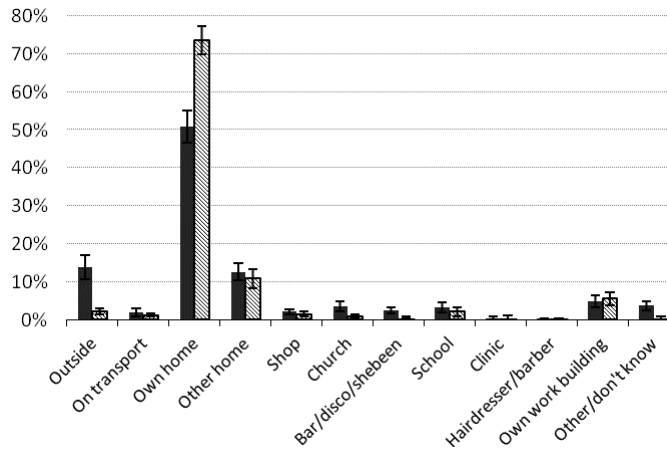
That is, a proportion q of an individual's contacts are with a corresponding age group $i + 2$ (the advancing peak in main text Figure 1), and a proportion $(1 - q)$ of an individual's contacts are at random across the 5 age groups. From this equation, an estimator of q from data on $p_{\alpha i}$ can be computed as: $\hat{q} = 5 \cdot (\sum_{\alpha=1}^3 \sum_{i=3}^5 p_{\alpha i} - 9)/6$.

We used this contact pattern, together with the demographic and prevalence data for South Africa and Zambia, under the assumption that the overall contact rates for an individual did not depend on the group α , to investigate how the infection rate in the 5-12 year age group underestimated that in adult age groups as the assortativity q changes. For this analysis, we aggregated demography and prevalence across males and females.

Web Figure 1

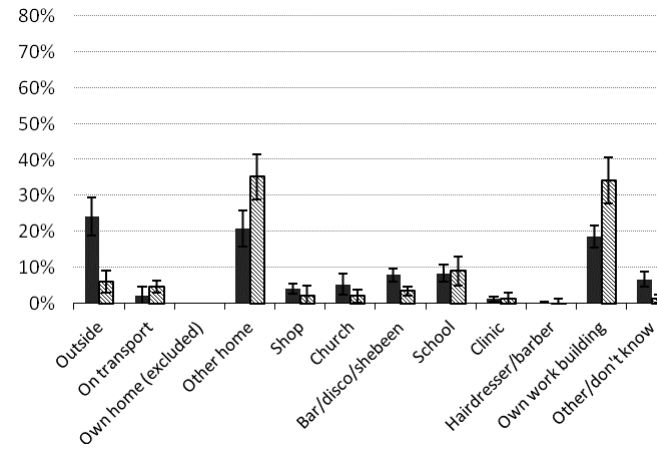
Proportion (95% confidence interval) of reported (a) close contacts, (b) close contact duration, (c) casual contacts and (d) casual contact duration, by contact location and setting for Zambia and the Western Cape, South Africa, 2011. (Zambia = solid bars; Western Cape, South Africa = dashed bars)

(a)



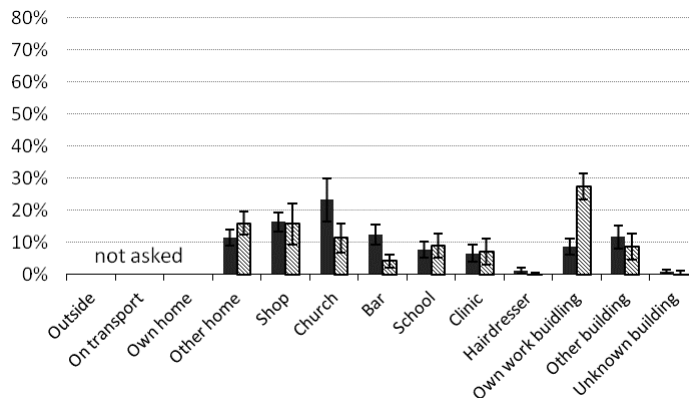
Zambia N=10,380 close contacts, Western Cape, South Africa N=6,637 close contacts. 4,34/17,451 contacts excluded due to missing location data.

(b)



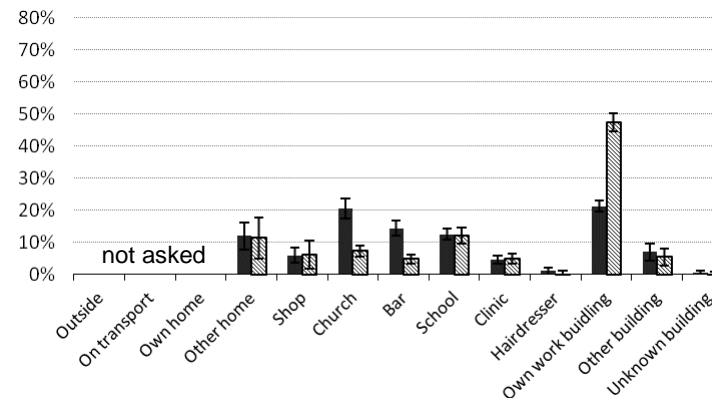
Zambia N = 5,028 close contacts; Western Cape, South Africa N = 1,806 close contacts. 9,986/16,820 'own home' contacts excluded.

(c)



Zambia N=26,331 casual contacts; Western Cape, South Africa N=11,797 casual contacts.

(d)



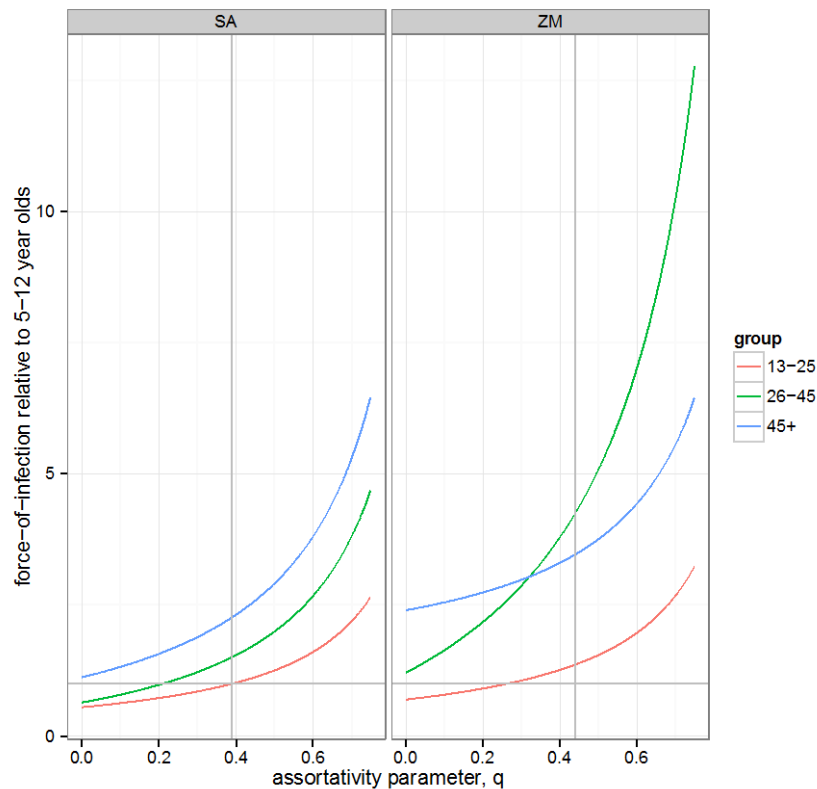
Zambia: 26,182 casual contacts; Western Cape, South Africa: 11,757 casual contacts. 189/38,128 casual contacts excluded due to missing duration data.

Web Table 2

Percentage [95% confidence interval] of close contacts of 18-25 year olds, 26-45 year olds and >45 year olds by gender and setting (rows), with all ages and gender (columns), and their crude total contact rate (final column).

	Gender	Age	With females					With males					With males All ages	all ages	Crude total contact rate per day
			0-4	5-12	13-25	All ages	>45	0-4	5-12	13-25	26-45	>45			
Western Cape, South Africa	Female	18-25	5.2[4.0;6.5]	7.3[5.9;8.8]	26.9[24.4;29.5]	16.8[14.7;18.9]	8.8[7.2;10.4]	4.9[3.7;6.2]	4.6[3.5;5.9]	9.2[7.6;10.9]	11.0[9.3;12.9]	5.2[4.0;6.6]	35.0[32.4;37.8]	100	5.7[5.3;6.0]
		26-45	5.8[4.7;7.0]	8.3[7.0;9.7]	15.5[13.6;17.3]	23.8[21.7;26.0]	7.3[6.0;8.6]	5.1[4.0;6.2]	5.8[4.7;7.1]	8.9[7.5;10.4]	14.5[12.8;16.3]	4.9[3.9;6.0]	39.3[36.9;41.7]	100	5.4 [5.1;5.6]
		>45	2.9[1.8;4.1]	6.6[4.9;8.4]	16.2[13.6;18.8]	19.4[16.6;22.2]	10.3[8.2;12.5]	4.6[3.1;6.1]	6.2[4.5;7.9]	13.0[10.7;15.5]	11.7[9.4;14.1]	9.2[7.2;11.3]	44.7[41.2;48.2]	100	5.3[4.9;5.7]
	Male	18-25	2.4[1.5;3.4]	3.2[2.2;4.3]	15.5[13.3;17.6]	11.9[10.0;13.9]	8.3[6.6;9.9]	2.2[1.3;3.1]	4.5[3.3;5.8]	30.2[27.5;33.1]	15.0[12.9;17.2]	6.9[5.5;8.5]	58.8[55.7;61.8]	100	5.5[5.2;5.9]
		26-45	2.6[1.8;3.5]	4.2[3.2;5.3]	12.3[10.6;14.1]	16.6[14.6;18.6]	7.0[5.7;8.4]	2.9[2.0;3.8]	4.0[3.0;5.1]	12.4[10.7;14.2]	29.4[27.0;31.8]	8.6[7.1;10.1]	57.3[54.6;59.9]	100	4.7 [4.5;5.0]
		>45	3.7[2.4;5.2]	4.7[3.2;6.3]	11.7[9.5;14.1]	14.4[11.9;17.0]	12.4[10.1;14.9]	3.0[1.9;4.4]	5.8[4.2;7.6]	13.0[10.5;15.5]	18.4[15.6;21.1]	12.9[10.4;15.4]	53.0[49.4;56.6]	100	4.7[4.4;5.1]
Zambia	Female	18-25	2.9[2.1;3.7]	4.9[3.9;5.9]	34.5[32.2;36.7]	17.7[15.9;19.5]	5.2[4.2;6.3]	2.3[1.6;3.0]	4.0[3.1;5.0]	14.3[12.7;16.0]	10.9[9.4;12.4]	3.4[2.5;4.2]	34.9[32.6;37.1]	100	4.4[4.2;4.6]
		26-45	3.4[2.8;4.1]	6.6[5.6;7.5]	16.7[15.3;18.2]	28.9[27.1;30.6]	6.4[5.5;7.3]	2.8[2.2;3.4]	6.4[5.4;7.3]	9.7[8.6;10.9]	14.4[13.1;15.8]	4.6[3.8;5.4]	38.0[36.1;39.8]	100	4.7[4.5;4.9]
		>45	1.3[0.7;2.1]	5.1[3.8;6.5]	17.3[15.1;19.6]	23.5[20.9;25.9]	15.0[12.9;17.1]	2.8[1.8;3.8]	5.3[4.0;6.7]	10.2[8.4;12.0]	8.1[6.5;9.7]	11.4[9.5;13.3]	37.7[34.9;40.7]	100	4.5[4.2;4.7]
	Male	18-25	0.9[0.5;1.3]	2.7[2.0;3.5]	15.8[14.2;17.4]	8.7[7.5;10.0]	3.6[2.8;4.4]	1.1[0.7;1.6]	3.6[2.8;4.4]	44.4[42.2;46.6]	14.6[13.1;16.2]	4.6[3.7;5.5]	68.3[66.2;70.3]	100	5.0[4.8;5.2]
		26-45	2.8[2.1;3.6]	5.0[4.0;6.0]	10.7[9.3;12.2]	14.7[13.1;16.4]	3.1[2.3;3.9]	2.1[1.4;2.7]	4.8[3.9;5.8]	14.6[13.0;16.3]	36.0[33.7;38.2]	6.2[5.1;7.3]	63.7[61.4;65.9]	100	4.9[4.6;5.1]
		>45	1.0[0.5;1.6]	3.6[2.6;4.6]	8.9[7.3;10.5]	11.7[10.0;13.4]	12.0[10.3;13.7]	1.1[0.5;1.6]	4.0[3.0;5.1]	9.5[8.0;11.1]	25.8[23.5;28.2]	22.5[20.2;24.8]	63.0[60.4;65.5]	100	4.2[4.0;4.4]

Web Figure 2



Web Figure 2: The ratio of force of *M.tb* infection in adult age groups to that in the 5-12 year old age group, as a function of age-assortativity in a simple model. The model is defined in the equation above. The vertical grey lines mark the estimate \hat{q} from the South African and Zambian data, and the horizontal grey line is at a ratio of 1.

The assortativity statistics for the South African and Zambian data were 0.39 and 0.44 respectively. For the older age groups, the modelled force-of-infection is substantially higher than that in 5-12 year olds across a wide range of assortativities, particularly in Zambia.

Web Table 3

Model-estimated percentage [95% confidence interval] of total M.tb. infection incidence for each age and gender of susceptible person (columns) due to infectious people (rows) of given age and gender, by setting, for 16 communities in Zambia and 8 communities in Western Cape, South Africa, in 2011.

Gender	Age	(Susceptible) Female					(Susceptible) Male					M+F All ages		
		0-4	5-12	13-25	26-45	>45	0-4	5-12	13-25	26-45	>45			
Western Cape, South Africa (Infectious)	Female	18-25	18.1[13.9;22.8]	17.2[13.7;20.9]	22.3[19.9;24.8]	12.6[10.9;14.5]	12.7[10.3;15.3]	17.4[13.2;21.9]	11.8[8.8;15.2]	8.5[6.9;10.1]	7.5[6.3;8.9]	8.1[6.1;10.3]	57.3[56.3;58.2]	
		26-45	23.9[19.1;28.9]	22.8[19.1;26.9]	15.0[13.0;17.0]	20.9[18.7;23.3]	12.2[10.0;14.6]	21.0[16.6;25.7]	17.3[13.8;21.1]	9.5[8.0;11.2]	11.6[10.1;13.3]	8.9[7.0;10.9]		
		>45	9.6[6.0;13.6]	14.6[10.9;18.6]	12.8[10.6;15.1]	13.9[11.8;16.1]	14.1[11.1;17.3]	15.5[10.8;20.5]	14.9[11.1;19.2]	11.4[9.3;13.7]	7.6[6.1;9.3]	13.5[10.6;16.6]		
	Male	18-25	8.6[5.5;12.0]	7.5[5.1;10.1]	12.9[10.9;15.0]	9.0[7.4;10.7]	12.0[9.5;14.6]	7.7[4.8;11.0]	11.4[8.4;14.8]	27.8[24.7;31.2]	10.3[8.6;12.0]	10.7[8.3;13.3]		
		26-45	20.3[14.5;26.3]	21.5[16.8;26.4]	22.5[19.4;25.6]	27.4[24.3;30.6]	22.1[18.3;26.4]	22.3[16.3;28.3]	22.5[17.4;27.8]	25.0[21.6;28.5]	44.2[40.7;47.7]	29.1[24.7;33.8]		
		>45	19.5[13.2;26.0]	16.4[11.5;21.6]	14.6[11.7;17.7]	16.2[13.2;19.3]	26.9[22.2;31.7]	16.2[10.2;22.6]	22.0[16.4;28.0]	17.8[14.5;21.5]	18.8[15.7;22.0]	29.6[24.5;34.8]		
M +	All ages	48.4[41.6;54.8]	45.4[40.1;50.6]	50.0[47.0;52.8]	52.6[49.7;55.3]	60.9[56.8;64.9]	46.0[39.2;52.4]	56.0[50.4;61.3]	70.6[67.9;73.3]	73.2[71.0;75.4]	69.5[65.5;73.3]			
Zambia (Infectious)	Female	18-25	14.0[10.2;18.2]	12.0[9.5;14.8]	26.9[24.8;29.2]	12.7[11.2;14.2]	12.4[9.9;15.1]	13.3[9.4;17.9]	10.1[7.7;12.7]	10.0[8.8;11.3]	5.1[4.4;5.9]	5.9[4.4;7.5]		65.7[64.4;66.8]
		26-45	21.6[16.7;26.8]	21.1[17.7;24.6]	17.1[15.4;18.9]	27.0[24.9;29.3]	20.0[17.0;23.2]	21.4[16.3;27.0]	20.9[17.5;24.5]	8.9[7.8;10.1]	8.9[7.9;9.9]	10.6[8.7;12.7]		
		>45	1.9[1.0;3.0]	3.8[2.7;4.9]	4.0[3.4;4.7]	5.0[4.3;5.7]	10.7[8.9;12.6]	4.9[3.1;6.9]	4.0[2.9;5.1]	2.1[1.7;2.5]	1.1[0.9;1.4]	6.0[4.9;7.2]		
	Male	18-25	4.5[2.5;6.9]	7.0[5.2;9.0]	12.9[11.5;14.5]	6.5[5.6;7.6]	9.1[7.0;11.2]	6.8[4.0;9.9]	9.3[7.2;11.7]	32.5[30.0;35.1]	7.2[6.3;8.2]	8.4[6.7;10.2]		
		26-45	55.1[46.9;62.8]	50.8[44.9;56.3]	34.7[31.3;38.1]	43.6[40.3;46.8]	30.3[24.3;36.3]	49.8[40.4;58.3]	49.6[43.6;55.3]	42.3[39.0;45.7]	70.2[67.9;72.3]	44.8[39.6;49.7]		
		>45	2.9[1.4;4.7]	5.4[3.9;7.1]	4.2[3.4;5.1]	5.1[4.3;6.1]	17.5[14.6;20.6]	3.8[1.9;6.0]	6.2[4.5;8.1]	4.1[3.3;4.9]	7.5[6.5;8.5]	24.3[21.2;27.7]		
M+F	All ages	62.5[55.3;68.9]	63.2[58.4;67.8]	51.9[49.1;54.6]	55.2[52.5;57.8]	56.9[52.3;61.2]	60.4[52.5;67.6]	65.1[60.4;69.6]	79.0[77.3;80.6]	84.8[83.6;86.1]	77.4[74.6;80.1]			