THE LANCET Global Health

Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

Supplement to: Nery JS, Ramond A, Pescarini JM. Socioeconomic determinants of leprosy new case detection in the 100 Million Brazilian Cohort: a population-based linkage study. *Lancet Glob Health* 2019; published online July 19. http://dx.doi. org/10.1016/S2214-109X(19)30260-8.

Supplementary material

Age groups (y)	Currently employed	Unemployed s	tudent	Unemployed		
		IRR (95%CI)	P-value	IRR (95%CI)	P-value	
CadÚnico registration: 2007-2009						
18-30	Ref	0.86 (0.80, 0.92)	< 0.001	0.79 (0.71, 0.89)	< 0.001	
30-40	Ref	0.90 (0.82, 0.98)	0.01	1.04 (0.91, 1.19)	0.57	
40-50	Ref	0.91 (0.82, 1.01)	0.07	1.18 (1.03, 1.36)	0.02	
50-60	Ref	0.78 (0.70, 0.88)	< 0.001	1.08 (0.95, 1.23)	0.23	
>60	Ref	0.69 (0.61, 0.78)	< 0.001	0.78 (0.63, 0.82)	< 0.001	
CadÚnico registration: 2011-2014						
18-30	Ref	0.86 (0.80, 0.92)	< 0.001	0.74 (0.71, 0.89)	< 0.001	
30-40	Ref	0.89 (0.37, 2.15)	0.79	1.06 (0.90, 1.26)	0.47	
40-50	Ref	0.33 (0.05, 2.37)	0.27	1.06 (0.88, 1.27)	0.53	
50-60	Ref	1.02 (0.33, 3.19)	0.97	0.88 (0.75, 1.03)	0.12	
>60	Ref	1.52 (0.48, 4.81)	0.48	1.07 (0.85, 1.37)	0.53	

Supplementary Table 1 Association of employment with leprosy in participants >18y, stratified by time period of registration.

IRR: incidence rate ratio for leprosy new case detection

IRRs were obtained using generalized linear Poisson models with clustered standard errors to account for clustering by family. As the questionnaire used to record employment changed in 2010, the analysis is stratified from 2007-2009 and 2011-2014.

Supplementary Figure 1 Forest plot of multivariate association of distal and intermediate sociodemographic determinants with paucibacillary and multibacillary leprosy

							IRR (95% CI)
							/
Age (10y) Age (10y)	MB PB						1.41 (1.40, 1.42 1.27 (1.26, 1.28
	TD				•		1.27 (1.20, 1.20
ex fele en Eeneele	М						1 70 (1 (2 1 7(
fale vs. Female fale vs. Female	MB PB			_	•		1.70 (1.63, 1.76 0.73 (0.70, 0.77
late vs. remate	TD			•			0.75 (0.70, 0.77
tegion of family home	мп	Distal					1 15 (1 02 1 20
outh-east vs. South outh-east vs. South	MB PB	Distal Distal					1.15 (1.03, 1.29 2.51 (2.07, 3.05
orth-east vs. South	MB	Distal					3.85 (3.46, 4.27
orth-east vs. South	PB	Distal				·	9.20 (7.63, 11.0
forth vs. South	MB	Distal				· · · ·	6.25 (5.61, 6.97
forth vs. South	PB	Distal				· _	13.79 (11.41, 16)
entral-West vs. South	MB	Distal				-	7.73 (6.94, 8.62
entral-West vs. South	PB	Distal				· · · · ·	10.53 (8.67, 12.
ocation of family home							
rban vs. Rural	MB	Distal			•		1.15 (1.09, 1.20
Irban vs. Rural	PB	Distal			•		1.35 (1.27, 1.43
thnicity/skin colour							
reto ("Black") vs. White	MB	Intermediate			•		1.39 (1.29, 1.51
reto ("Black") vs. White	PB	Intermediate			↓ <u>↓</u>		1.42 (1.28, 1.57
ardo ("Brown") vs. White	MB	Intermediate			•		1.25 (1.18, 1.32
ardo ("Brown") vs. White	PB	Intermediate			•		1.29 (1.21, 1.38
sian vs. White	MB	Intermediate			♦		1.07 (0.77, 1.48
sian vs. White	PB	Intermediate		_	↓		1.22 (0.81, 1.84
ndigenous vs. White	MB	Intermediate		←			0.40 (0.29, 0.55
ndigenous vs. White	PB	Intermediate		<u> </u>			0.38 (0.25, 0.58
Education							
ear 10 to 12 vs. Higher education	MB	Intermediate					1.49 (1.02, 2.16
ear 10 to 12 vs. Higher education	PB	Intermediate		-	· · ·		1.29 (0.90, 1.85
ear 6 to 9 vs. Higher education	MB	Intermediate					2.05 (1.41, 2.97
ear 6 to 9 vs. Higher education	PB	Intermediate			—		1.51 (1.06, 2.15
ear 1 to 5 vs. Higher education	MB	Intermediate					2.37 (1.63, 3.44
ear 1 to 5 vs. Higher education	PB	Intermediate					1.56 (1.09, 2.22
re-school or no education or illiterate	MB	Intermediate			→	_	2.63 (1.81, 3.83
s. Higher education re-school or no education or illiterate	PB	Intermediate					1.53 (1.07, 2.20
s. Higher education	гD	memetate					1.55 (1.07, 2.20
mployment							
nemployed student vs. Currently employed	MB	Intermediate		•			0.89 (0.85, 0.94
nemployed student vs. Currently employed	PB	Intermediate			•		1.04 (0.98, 1.10
nemployed (not student) vs. Currently employed		Intermediate		•			0.72 (0.68, 0.76
nemployed (not student) vs. Currently employed	PB	Intermediate		+			0.73 (0.68, 0.79
ncome per capita							
.5-1 min salary $vs. > 1$ min salary	MB	Intermediate		-			0.98 (0.88, 1.10
5-1 min salary $vs. > 1$ min salary	PB	Intermediate		-+			0.88 (0.74, 1.03
25-0.5 min salary $vs. >1$ min salary	MB	Intermediate					1.23 (1.10, 1.38
25-0.5 min salary vs. >1 min salary	PB MB	Intermediate					1.22 (1.05, 1.44
-0.25 min salary vs. >1 min salary	MB	Intermediate					1.51 (1.36, 1.69
-0.25 min salary vs. >1 min salary	PB MB	Intermediate Intermediate					1.39 (1.19, 1.62
to income $vs. >1$ min salary	MB PB	Intermediate Intermediate					1.60 (1.42, 1.81
to income vs. >1 min salary	гв	mennediate					1.27 (1.07, 1.51
							1
		.1	.2	.5	1 2.5	5 10	17

IRR: incidence rate ratio for leprosy new case detection, MB: multibacillary, PB: paucibacillary IRRs were obtained using generalized linear Poisson models with clustered standard errors to account for clustering by family. A complete case analysis approach was adopted excluding individuals with missing data in any of the three models from all models.

Supplementary Figure 2 Forest plot of multivariate association of proximal socio-demographic determinants with paucibacillary and multibacillary leprosy

				IRR (95% CI)
Housing material				
Not brick or cement vs. Brick/cement	MB	Proximal	· · · · · · · · · · · · · · · · · · ·	1.45 (1.38, 1.53)
Not brick or cement vs. Brick/cement	РВ	Proximal	_ -	1.18 (1.11, 1.27)
Household water supply				
Non-public network vs. Public network	MB	Proximal	_	0.99 (0.94, 1.05)
Non-public network vs. Public network	РВ	Proximal		0.94 (0.88, 1.00)
Sewage disposal system				
Non-public network vs. Public network	MB	Proximal	_ _	1.36 (1.30, 1.43)
Non-public network vs. Public network	РВ	Proximal	_ -	1.32 (1.24, 1.40)
Source of lighting				
Community counter vs. Home counter	MB	Proximal	_	0.98 (0.88, 1.08)
Community counter vs. Home counter	PB	Proximal		0.87 (0.76, 0.99)
Illegal electricity or other lighting	MB	Proximal	_	1.05 (0.99, 1.11)
vs. Home counter Illegal electricity or other lighting vs. Home counter	PB	Proximal		1.00 (0.93, 1.08)
Waste collection				
Non public collection system vs. Public collection system	MB	Proximal		1.02 (0.95, 1.10)
Non public collection system <i>vs.</i> Public collection system	РВ	Proximal	_	0.90 (0.82, 0.98)
Density (individuals/room)				
0.5-0.75 vs. <0.5	MB	Proximal	+	1.02 (0.96, 1.08)
0.5-0.75 vs. <0.5	PB	Proximal		1.04 (0.96, 1.12)
0.75-1.00 <i>vs</i> . <0.5	MB	Proximal	+ _	0.97 (0.91, 1.03)
0.75-1.00 <i>vs</i> . <0.5	PB	Proximal	→	1.08 (1.01, 1.17)
>1.00 vs. <0.5	MB	Proximal	_	0.94 (0.89, 1.01)
>1.00 vs. <0.5	РВ	Proximal	_	1.02 (0.94, 1.10)
				1.6
			.6	1.6

IRR: incidence rate ratio for leprosy new case detection, MB: multibacillary, PB: paucibacillary IRRs were obtained using generalized linear Poisson models with clustered standard errors to account for clustering by family. A complete case analysis approach was adopted excluding individuals with missing data in any of the three models from all models.

Supplementary Figure 3 Forest-plot of multivariate association of distal and intermediate sociodemographic determinants with leprosy by region of residence

										IRR (95% CI)
Age (10y)	a 1/0 1 /									
Age (10y) Age (10y)	South/Southeast Northeast									1.36 (1.34, 1.37) 1.36 (1.35, 1.37)
Age (10y)	North									1.33 (1.31, 1.35)
Age (10y)	Midwest									1.36 (1.35, 1.38)
C										
Sex Male vs. Female	South/Southeast					•				1.33 (1.23, 1.42)
Male vs. Female	Northeast					•				1.35(1.25, 1.42) 1.11(1.06, 1.16)
Male vs. Female	North					•				1.32 (1.25, 1.41)
Male vs. Female	Central-West					•				1.27 (1.18, 1.36)
Location of family home	C 4/C 4 4	D' (1								0.05 (0.05, 1.07)
Urban vs. Rural Urban vs. Rural	South/Southeast Northeast	Distal Distal								0.95(0.85, 1.07)
Urban vs. Rural	North	Distal				•				1.50 (1.41, 1.59) 1.13 (1.06, 1.21)
Urban vs. Rural	Central-West	Distal								0.92(0.83, 1.03)
	contrait west	Distai								0.52 (0.05, 1.05)
Ethnicity/skin colour										
Preto ("Black") vs. White	South/Southeast	Intermediate								1.63(1.44, 1.84)
Preto ("Black") vs. White	Northeast	Intermediate								1.29(1.16, 1.44)
Preto ("Black") vs. White	North Central-West	Intermediate Intermediate				-				1.36(1.17, 1.58)
Preto ("Black") vs. White Pardo ("Brown") vs. White	South/Southeast	Intermediate				•				1.41 (1.23, 1.62) 1.63 (1.51, 1.76)
Pardo ("Brown") vs. White	Northeast	Intermediate				•				1.34(1.25, 1.44)
Pardo ("Brown") vs. White	North	Intermediate								0.92 (0.83, 1.01)
Pardo ("Brown") vs. White	Central-West	Intermediate				•				1.16 (1.07, 1.26)
Asian vs. White	South/Southeast	Intermediate			-	• •				1.49 (0.84, 2.63)
Asian vs. White	Northeast	Intermediate				• ·				1.19 (0.78, 1.82)
Asian vs. White	North	Intermediate				•				1.06 (0.59, 1.91)
Asian vs. White	Central-West	Intermediate				<u> </u>				0.84 (0.49, 1.44)
Indigenous vs. White	South/Southeast	Intermediate			. –	+				1.75 (0.83, 3.68)
Indigenous vs. White	Northeast	Intermediate				<u> </u>				0.74 (0.42, 1.31)
Indigenous vs. White	North	Intermediate			_					0.27 (0.18, 0.39)
Indigenous vs. White	Central-West	Intermediate	-	•						0.18 (0.10, 0.32)
Education										
Year 10 to 12 vs. Higher education	South/Southeast	Intermediate								3.89 (1.45, 10.44)
Year 10 to 12 vs. Higher education	Northeast	Intermediate				-				1.14 (0.78, 1.66)
Year 10 to 12 vs. Higher education	North	Intermediate			_	• •				1.47 (0.81, 2.67)
Year 10 to 12 vs. Higher education	Central-West	Intermediate				+				1.15 (0.65, 2.06)
Year 6 to 9 vs. Higher education	South/Southeast	Intermediate								4.85 (1.81, 12.97)
Year 6 to 9 vs. Higher education	Northeast	Intermediate								1.36 (0.94, 1.98)
Year 6 to 9 vs. Higher education	North	Intermediate								1.94 (1.06, 3.46)
Year 6 to 9 vs. Higher education	Central-West	Intermediate				•				1.70 (0.96, 3.02)
Year 1 to 5 vs. Higher education	South/Southeast	Intermediate								5.95 (2.23, 15.92)
Year 1 to 5 vs. Higher education	Northeast	Intermediate								1.42 (0.97, 2.06)
Year 1 to 5 vs. Higher education	North Control West	Intermediate					<u> </u>			2.20(1.21, 3.97)
Year 1 to 5 vs. Higher education	Central-West South/Southeast	Intermediate Intermediate				•		-		1.86(1.05, 3.31)
Pre-school, no education or illiterate vs. Higher education	South/Southeast	Intermediate						•		7.47 (2.77, 20.10)
Pre-school, no education or illiterate	Northeast	Intermediate					_			1.57 (1.07, 2.29)
vs. Higher education	Wortheast	memediate				· ·				1.57 (1.07, 2.27)
Pre-school, no education or illiterate	North	Intermediate								2.26 (1.24, 4.10)
vs. Higher education							-			2.20 (1.2.1, 1.10)
Pre-school, no education or illiterate	Central-West	Intermediate								1.91 (1.06, 3.41)
vs. Higher education	Central-west	memediate				•				1.91 (1.00, 5.41)
Employment										
	0 1/0 1 1	T . T .								0.04 (0.06, 1.04)
Unemployed student vs. Employed	South/Southeast Northeast	Intermediate Intermediate								0.94 (0.86, 1.04) 0.92 (0.87, 0.98)
Unemployed student vs. Employed Unemployed student vs. Employed	North	Intermediate				4				1.00(0.92, 1.08)
Unemployed student vs. Employed	Central-West	Intermediate			•	é				0.98 (0.89, 1.08)
Unemployed (not student) vs. Employed		Intermediate			+	-				0.70 (0.63, 0.78)
Unemployed (not student) vs. Employed		Intermediate			•					0.75 (0.69, 0.81)
Unemployed (not student) vs. Employed	North	Intermediate			• .					0.67 (0.61, 0.75)
Unemployed (not student) vs. Employed	Central-West	Intermediate			+					0.78 (0.70, 0.87)
Income per capita										
0.5-1 min salary vs. >1 min salary	South/Southeast	Intermediate			-	+ -				1.09 (0.92, 1.30)
0.5-1 min salary vs. >1 min salary	Northeast	Intermediate				-				1.04 (0.86, 1.25)
0.5-1 min salary vs. >1 min salary	North	Intermediate								0.80 (0.64, 0.99)
0.5-1 min salary vs. >1 min salary	Central-West	Intermediate								0.90 (0.75, 1.07)
0.25-0.5 min salary vs. >1 min salary	South/Southeast	Intermediate			-					1.18 (0.99, 1.41)
$0.25 \cdot 0.5 \text{ min salary } vs. >1 \text{ min salary}$	Northeast	Intermediate								1.37 (1.14, 1.66)
$0.25 \cdot 0.5$ min salary vs. >1 min salary	North	Intermediate								1.14(0.91, 1.42)
0.25-0.5 min salary vs. >1 min salary	Central-West	Intermediate								1.21 (1.01, 1.44)
0-0.25 min salary vs. >1 min salary	South/Southeast	Intermediate								1.41 (1.18, 1.68)
0-0.25 min salary vs. >1 min salary	Northeast	Intermediate			_					1.77 (1.48, 2.12)
0-0.25 min salary vs. >1 min salary	North	Intermediate								1.14(0.92, 1.42)
0-0.25 min salary vs. >1 min salary	Central-West	Intermediate								1.44 (1.21, 1.71)
No income vs. >1 min salary No income vs. >1 min salary	South/Southeast Northeast	Intermediate Intermediate				—				1.50 (1.23, 1.83) 1.63 (1.34, 1.98)
No income vs. >1 min salary No income vs. >1 min salary	North	Intermediate				↓↓ [⋆]				1.28 (1.02, 1.61)
No income $vs. > 1$ min salary	Central-West	Intermediate				- -				1.23(1.02, 1.01) 1.41(1.15, 1.73)
2										/
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			.1	.2	.5	1	2.5	5	10 17	
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IRR: incidence rate ratio for leprosy new case detection. IRRs were obtained using generalized linear Poisson models with clustered standard errors to account for clustering by family. A complete case analysis approach was adopted excluding individuals with missing data in any of the three models from all models.

Supplementary Figure 4 Forest-plot of multivariate association of proximal socio-demographic determinants with leprosy by region of residence

Notivity or content Vs. Brick creamers Northean Provinal 0.89 (0.79, 1.01) Not bick or content Vs. Brick creamers North Provinal 0.89 (0.79, 1.01) Not bick or content Vs. Brick creamers Catal New Provinal 0.98 (0.57, 1.02) House public network Vs. Public serveds Northeas Provinal 0.98 (0.57, 1.02) None public network Vs. Public serveds Northeas Provinal 0.98 (0.57, 1.02) None public network Vs. Public serveds Northeas Provinal 0.98 (0.57, 1.02) None public network Vs. Public serveds Northeas Provinal 1.25 (1.13, 1.32) None public network Vs. Public serveds Northeas Provinal 1.25 (1.13, 1.22) None public network Vs. Public serveds Northeas Provinal 1.25 (1.14, 1.72) None public network Vs. Public serveds Northeas Provinal 1.25 (1.14, 1.72) None public network Vs. Public serveds Northeas Provinal 0.97 (0.98, 1.12) None public network Vs. Public serveds Northeas Provinal 0.97 (0.94, 1.12) None public network Vs. Public serveds Northeas Provinal 0.97 (0.94, 1.12) Continuative c					IRR (95% CI)
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Non-public network vs. Public network v	Not brick or cement vs. Brick/cement	Central-West	Proximal		1.//(1.61, 1.95)
Non-public network vs. Public network Non-public network vs. Public network Northeast Non-public network vs. Public network Northeast Nort	Household water supply				
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Nar-public network vs. Public network Central-West Proximal 1.06(0.93, 1.17) Servage disposal system Non-public network vs. Public network Northant Proximal Non-public network vs. Public network Northant Proximal 1.25(1.13, 1.32) Non-public network vs. Public network Northant Proximal 1.25(1.13, 1.23) Non-public network vs. Public network Central-West Proximal 0.97(0.84, 1.12) Community counter vs. Home counter Northant Proximal 0.92(0.78, 1.02) Community counter vs. Home counter Northant Proximal 0.92(0.78, 1.02) Community counter vs. Home counter Northant Proximal 0.92(0.78, 1.02) Community counter vs. Home counter Northant Proximal 0.92(0.78, 1.02) Community counter vs. Home counter Northant Proximal 0.92(0.78, 1.02) Ilegal destrictivy or other lighting Northant Proximal 0.97(0.81, 1.02) Ws. Home counter Northant Proximal 0.97(0.91, 1.25) Ws. Home counter Northant Proximal 0.97(0.91, 1.25) Ws. Home counter Northant Proximal 0.	Non-public network vs. Public network	Northeast	Proximal		0.76 (0.71, 0.82)
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0.5-0.75 vs. <0.5	vs. Public collection				
0.5-0.75 vs. <0.5	Density (individuals/room)				
0.5-0.75 vs. <0.5	0.5-0.75 vs. <0.5	South/Southeast	Proximal		0.82 (0.73, 0.92)
0.5-0.75 vs. <0.5	0.5-0.75 vs. <0.5	Northeast	Proximal	_ ↓	
0.5-0.75 vs. <0.5	0.5-0.75 vs. <0.5	North	Proximal	_	0.94 (0.84, 1.05)
0.75-1.00 vs. <0.5	0.5-0.75 vs. <0.5	Central-West	Proximal	→	1.21 (1.08, 1.35)
0.75-1.00 vs. <0.5	0.75-1.00 vs. <0.5	South/Southeast	Proximal	_	
0.75-1.00 vs. <0.5	0.75-1.00 vs. <0.5	Northeast	Proximal		
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IRR: incidence rate ratio for leprosy new case detection. IRRs were obtained using generalized linear Poisson models with clustered standard errors to account for clustering by family. A complete case analysis approach was adopted excluding individuals with missing data in any of the three models from all models.

	Model	1	Model 2	*	Model 3 **		
Variable	IRR	P-value	IRR	P-value	IRR	P-value	
Age (per 10y)	1.32 (1.32, 1.33)	< 0.001	1.35 (1.34, 1.36)	< 0.001	1.36 (1.35, 1.36)	< 0.001	
Sex Female	Ref						
Male	1.25 (1.21, 1.28)	< 0.001	1.22 (1.19, 1.26)	< 0.001	1.22 (1.19, 1.26)	< 0.001	
Year at baseline	1.23 (1.21, 1.26)	~0.001	1.22 (1.19, 1.20)	<0.001	1.22 (1.19, 1.20)	<0.001	
2007	Ref		Ref		Ref		
2008		<0.001		<0.001		<0.001	
	0.82 (0.79, 0.86)	< 0.001	0.85 (0.82, 0.89)	<0.001	0.87 (0.83, 0.90)	< 0.001	
2009	0.81 (0.78, 0.85)	< 0.001	0.84 (0.80, 0.88)	< 0.001	0.86 (0.82, 0.91)	< 0.001	
2010	0.77 (0.72, 0.82)	< 0.001	0.80 (0.75, 0.86)	< 0.001	0.83 (0.77, 0.88)	< 0.001	
2011	0.62 (0.57, 0.66)	< 0.001	0.73 (0.68, 0.79)	< 0.001	0.75 (0.70, 0.81)	< 0.001	
2012	0.55 (0.52, 0.59)	< 0.001	0.67 (0.59, 0.72)	< 0.001	0.69 (0.65, 0.74)	< 0.001	
2013	0.54 (0.49, 0.60)	< 0.001	0.65 (0.59, 0.72)	< 0.001	0.67 (0.61, 0.75)	< 0.001	
2014	0.60 (0.53, 0.68)	< 0.001	0.74 (0.64, 0.85)	< 0.001	0.76 (0.67, 0.88)	< 0.001	
Distal variables Region of family home							
South	Ref						
South-east	1.43 (1.30, 1.58)	< 0.001					
North-east	4.71 (4.30, 5.16)	< 0.001					
North	7.47 (6.80, 8.20)	< 0.001					
Central-West	8.30 (7.55, 9.13)	< 0.001					
Location of family home	0.50 (7.55, 7.15)	40.001					
Rural	Ref						
Urban	1.28 (1.23, 1.33)	< 0.001					
Intermediate variables							
Ethnicity/skin colour							
White			Ref				
Preto ("Black")			1.40 (1.31, 1.49)	< 0.001			
Pardo ("Brown")			1.26 (1.21, 1.32)	< 0.001			
Asian			1.18 (0.91, 1.52)	0.21			
Indigenous			0.39 (0.30, 0.51)	< 0.001			
Highest level of education***							
Higher education			Ref				
Year 10 to 12			1.48 (1.13, 1.94)	0.004			
Year 6 to 9			1.79 (1.37, 2.34)	< 0.001			
Year 1 to 5 Pre-school or no education or illiterate			1.96 (1.50, 2.56) 1.94 (1.48, 2.54)	<0.001 <0.001			
Employment***			1.91 (1.10, 2.51)	-0.001			
Currently employed			Ref				
Unemployed student			0.90 (0.87, 0.94)	< 0.001			
Unemployed (not student)			0.81 (0.77, 0.85)	< 0.001			
Income per capita			. ,				
>1 min salary			Ref				
0.5-1 min salary			0.96 (0.88, 1.06)	0.45			
0.25-0.5 min salary			1.20 (1.09, 1.32)	< 0.001			
0-0.25 min salary			1.38 (1.26, 1.52)	< 0.001			

Supplementary Table 2 Multivariate hierarchical association of socioeconomic factors with leprosy incidence adjusting for year of entry into the 100 Million Brazilian cohort

No income	1.41 (1.28, 1.56)	< 0.001		
Proximal variables				
Housing material				
Brick or cement			Ref	
Taipa/Wood/Other			1.32 (1.27, 1.38)	< 0.00
Household water supply				
Public network Well/Natural			Ref	0.10
source/Cistern/Other			0.97 (0.93, 1.01)	0.12
Sewage disposal system				
Public network			Ref	
Septic tank/Ditch/Other			1.34 (1.29, 1.39)	< 0.00
Electricity in family home				
Home counter			Ref	
Community counter Illegal electricity/Gas			0.96 (0.88, 1.04)	0.31 0.18
lighting/Candlelight/Other			1.03 (0.98, 1.08)	0.18
Waste collection system			D C	
Public collection system Burned/Buried/Outdoor disposal/Other			Ref 0.97 (0.91, 1.02)	0.17
Density (individuals/room)			0197 (0191, 1102)	0117
<=0.5			Ref	
0.5-0.75			1.01 (0.96, 1.06)	0.66
0.75-1.00			0.99 (0.94, 1.04)	0.69
>1.00			0.94 (0.89, 0.98)	0.008

IRR: incidence rate ratio for leprosy new case detection

IRRs were obtained using generalized linear Poisson models with clustered standard errors to account for clustering by family. A complete case analysis approach was adopted excluding individuals with missing data in any of the three models from all models.

*Model 2: covariates in Model 2 are adjusted for covariates from Model 1 with a p-value<0.1, i.e. Model 2 is adjusted for region and location of family home

**Model 3: covariates from Model 3 are adjusted for covariates from Model 1 and Model 2 with a p-value<0.1, i.e. Model 3 is adjusted for region, location of family home, ethnicity, education, employment, and income

***Information on education and employment are reported at the individual level for adult individuals (>18y) and for the oldest member of the family for individuals aged under 18y

	Model	1	Model 2	*	Model 3 **		
Variable	IRR	P-value	IRR	P-value	IRR	P-valu	
Age (per 10y)	1.33 (1.32, 1.34)	< 0.001	1.38 (1.37, 1.39)	< 0.001	1.38 (1.37, 1.39)	< 0.001	
Sex Female	Ref						
		-0.001	1 20 (1 24 1 20)	-0.001	1 20 (1 22 1 25)	-0.001	
Male Distal variables	1.32 (1.26, 1.38)	< 0.001	1.29 (1.24, 1.36)	< 0.001	1.29 (1.23, 1.35)	< 0.001	
Region of family home							
South	Ref						
South-east	1.55 (1.35, 1.78)	< 0.001					
North-east	5.14 (4.51, 5.87)	< 0.001					
North		< 0.001					
	8.67 (7.58, 9.94)						
Central-West Location of family home	8.30 (7.23, 9.51)	< 0.001					
Rural	Ref						
Urban	1.23 (1.16, 1.31)	< 0.001					
Ulball	1.25 (1.10, 1.51)	<0.001					
Intermediate variables							
Ethnicity/skin colour							
White			Ref				
Preto ("Black")			1.46 (1.33, 1.61)	< 0.001			
Pardo ("Brown")			1.28 (1.20, 1.36)	< 0.001			
Asian			0.95 (0.64, 1.42)	0.81			
Indigenous			0.49 (0.33, 0.73)	< 0.001			
Highest level of education***							
Higher education			Ref				
Year 10 to 12			1.45 (0.93, 2.25)	0.102			
Year 6 to 9			1.92 (1.24, 2.98)	0.003			
Year 1 to 5			2.09 (1.35, 3.24)	0.001			
Pre-school or no education or illiterate			2.22 (1.42, 3.45)	< 0.001			
Employment***			2.22 (1.42, 5.45)	<0.001			
Currently employed			Ref				
Unemployed student			1.06 (0.99, 1.12)	0.09			
Unemployed (not student)			0.73 (0.68, 0.78)	< 0.001			
Income per capita			0.75 (0.08, 0.78)	<0.001			
>1 min salary			Ref				
0.5-1 min salary			0.88 (0.78, 0.99)	0.04			
0.25-0.5 min salary			1.12 (0.99, 1.27)	0.08			
0-0.25 min salary			1.39 (1.23, 1.57)	< 0.001			
No income			1.49 (1.29, 1.71)	< 0.001			
Proximal variables			1.49 (1.29, 1.71)	\$0.001			
Housing material							
Brick or cement					Ref		
Taipa/Wood/Other					1.32 (1.24, 1.41)	< 0.001	
Household water supply					· · · /		
Public network					Ref		
Well/Natural source/Cistern/Other					1.00 (0.93, 1.07)	0.97	
Sewage disposal system					1.00 (0.55, 1.07)	5.77	
Public network					Ref		

Supplementary Table 3 Multivariate hierarchical association of socioeconomic factors with leprosy incidence restricted to 2 years of follow-up (N=23,670,871)

Septic tank/Ditch/Other	1.34 (1.26, 1.42)	< 0.001
Electricity in family home		
Home counter	Ref	
Community counter Illegal electricity/Gas	1.08 (0.97, 1.22)	0.31
lighting/Candlelight/Other	1.08 (1.00, 1.16)	0.06
Waste collection system		
Public collection system Burned/Buried/Outdoor	Ref	
disposal/Other	1.00 (0.91, 1.09)	0.93
Density (individuals/room)		
<=0.5	Ref	
0.5-0.75	0.96 (0.89, 1.03)	0.23
0.75-1.00	1.00 (0.93, 1.07)	0.92
>1.00	0.87 (0.80, 0.94)	0.001

IRR: incidence rate ratio for leprosy new case detection

IRRs were obtained using generalized linear Poisson models with clustered standard errors to account for clustering by family. A complete case analysis approach was adopted excluding individuals with missing data in any of the three models from all models.

*Model 2: covariates in Model 2 are adjusted for covariates from Model 1 with a p-value<0.1, i.e. Model 2 is adjusted for region and location of family home

**Model 3: covariates from Model 3 are adjusted for covariates from Model 1 and Model 2 with a p-value<0.1, i.e. Model 3 is adjusted for region, location of family home, ethnicity, education, employment, and income

***Information on education and employment are reported at the individual level for adult individuals (>18y) and for the oldest member of the family for individuals aged under 18y