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Suicide and poverty in low-income and middle-income countries: a systematic review (Supplement)

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Supplementary appendix

Appendix I: Search strategy

Appendix II: Country classification

Appendix III: Characteristics of included studies, by poverty dimension (N=37)

Appendix I: Search strategy

MEDLINE (OvidSP)

- 1 exp self-injurious behavior/
- 2 exp euthanasia/ or suicide, assisted/
- 3 1 not 2
- 4 (suicid* or parasuicid* or "self-killing" or self-injur* or self-mutilat* or self-harm* or self-immolat* or self-poison* or defenestrat* or self-drowning or self-hang* or "deliberate overdose").mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
- 5 ("assisted suicide" or euthanasia or "assisted dying").mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
- 6 4 not 5
- 7 exp Socioeconomic Factors/ or External Debt/
- 8 career mobility/ or exp social class/
- 9 7 not 8
- 10 (poverty or deprivation or poor* or distress or hardship or destitut* or "economic barrier" or "economic burden" or "financial distress" or "financial stress" or debt* or "catastrophic expenditure" or "catastrophic payment" or income or socioeconomic or socio-economic or wealth).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
- 11 (Afghanistan or Bangladesh or Benin or "Burkina Faso" or Burundi or Cambodia or "Central African Republic" or Chad or Comoros or "Democratic Republic of the Congo" or DRC or Zaire or Eritrea or Ethiopia or Gambia or Guinea or Guinea-Bissau or "Guinea Bissau" or Haiti or Kenya or "Democratic Republic of Korea" or "North Korea" or DPRK or Kyrgyzstan or "Kyrgyz Republic" or Liberia or Madagascar or Malawi or Mali or Mozambique or Myanmar or Burma or Nepal or Niger or Rwanda or "Sierra Leone" or Somalia or "South Sudan" or Tajikistan or Tanzania or Togo or Uganda or Zimbabwe).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
- 12 (Armenia or Bhutan or Bolivia or Cameroon or "Cape Verde" or "Cabo Verde" or Congo or "Cote d Ivoire" or "Ivory Coast" or Djibouti or Egypt or "El Salvador" or Georgia or Ghana or Guatemala or Guyana or Honduras or India or Indonesia or Kiribati or Kosovo or Lao or Laos or Lesotho or Mauritania or Micronesia or Moldova or Mongolia or Morocco or Nicaragua or Nigeria or Pakistan or "Papua New Guinea" or Paraguay or Philippines or Samoa or "Sao Tome" or Principe or Senegal or "Solomon Islands" or "Sri Lanka" or Sudan or Swaziland or Syria or "Syrian Arab Republic" or Timor-Leste or "Timor Leste" or "East Timor" or Ukraine or Uzbekistan or Vanuatu or Vietnam or "Viet Nam" or "West Bank" or Gaza or Yemen or Zambia).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
- 13 (Albania or Algeria or "American Samoa" or Angola or "Argentine Republic" or Argentina or Azerbaijan or Belarus or Belize or Bosnia or Herzegovina or Botswana or Brazil or Bulgaria or China or Colombia or "Costa Rica" or Cuba or Dominica or "Dominican Republic" or Ecuador or Fiji or Gabon or Grenada or Hungary or Iran or Iraq or Jamaica or Jordan or Kazakhstan or Lebanon or Libya or Macedonia or Malaysia or Maldives or "Marshall Islands" or Mauritius or Mexico or Montenegro or Namibia or Palau or Panama or Peru or Romania or Serbia or Seychelles or "South Africa" or "St Lucia" or "Saint Lucia" or "St Vincent" or "Saint Vincent" or Grenadines or Suriname or Thailand or Tonga or Tunisia or Turkey or Turkmenistan or Tuvalu or Venezuela).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
- 14 developing countries/ or exp africa/ or exp asia, central/ or exp asia, southeastern/ or exp central america/ or exp south america/ or exp middle east/
- 15 ("developing country" or "developing countries" or "low-income country" or "low-income countries" or "low income country" or "low income countries" or "middle-income country" or "middle-income countries" or "middle income country" or "middle income countries" or "third

world" or Africa or "Central Asia" or "South Asia" or "Southeast Asia" or "South-East Asia" or "Central America" or "Latin America" or "South America" or "Middle East").mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]

- 16 3 or 6
- 17 9 or 10
- 18 11 or 12 or 13 or 14 or 15
- 19 16 and 17 and 18
- 20 limit 19 to yr="2004 -Current"

Appendix II: Country classification¹

Low income:

Afghanistan, Bangladesh, Benin, Burkina Faso, Burundi, Cambodia, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Eritrea, Ethiopia, Gambia, The, Afghanistan, Bangladesh, Benin, Burkina Faso, Burundi, Cambodia, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Eritrea, Ethiopia, Gambia, The, Guinea, Guinea-Bissau, Haiti, Kenya, Korea, Dem. Rep., Kyrgyz Republic, Liberia, Madagascar, Malawi, Mali, Mozambique, Myanmar, Nepal, Niger, Rwanda, Sierra Leone, Somalia, South Sudan, Tajikistan, Tanzania, Togo, Uganda, Zimbabwe.

Lower middle income:

Armenia, Bhutan, Bolivia, Cameroon, Cabo Verde, Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., El Salvador, Georgia, Ghana, Guatemala, Guyana, Honduras, India, Indonesia, Kiribati, Kosovo, Lao PDR, Lesotho, Mauritania, Micronesia, Fed. Sts., Moldova, Mongolia, Morocco, Nicaragua, Nigeria, Pakistan, Papua New Guinea, Paraguay, Philippines, Samoa, Sao Tome and Principe, Senegal, Solomon Islands, Sri Lanka, Sudan, Swaziland, Syrian Arab Republic, Timor-Leste, Ukraine, Uzbekistan, Vanuatu, Vietnam, West Bank and Gaza, Yemen, Rep., Zambia.

Upper middle income:

Albania, Algeria, American Samoa, Angola, Argentina, Azerbaijan, Belarus, Belize, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, China, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, Fiji, Gabon, Grenada, Hungary, Iran, Islamic Rep., Iraq, Jamaica, Jordan, Kazakhstan, Lebanon, Libya, Macedonia, FYR, Malaysia, Maldives, Marshall Islands, Mauritius, Mexico, Montenegro, Namibia, Palau, Panama, Peru, Romania, Serbia, Seychelles, South Africa, St. Lucia, St. Vincent and the Grenadines, Suriname, Thailand, Tonga, Tunisia, Turkey, Turkmenistan, Tuvalu, Venezuela, RB

Appendix III: Characteristics of included studies, by poverty dimension (N=37)

First author	Setting	Study population	Study design (sample size)	Poverty dimension	Suicide dimension ^a	Analysis	Association between poverty-suicide	Study quality ^b
Individual level								
Relative poverty								
Borges et al, 2010 ^{2,c}	21 countries Community based (rural and urban)	Adults (n/a age) n/a gender	Cross-sectional study (n=108705)	Relative poverty Family income defined into four categories based on the ratio of income to number of family members relative to the official poverty line (self-reported as part of WHO Composite International Diagnostic Interview)	Non-fatal	Bivariate	Null	++
					Planned and unplanned 12 month suicide attempt (self-report as part of WHO Composite International Diagnostic Interview)		12-month planned suicide attempt among 12-month ideators: OR=1.5, 96% CI 0.7–2.8, p>0.05 12-months unplanned suicide attempt among 12-month ideators: OR=0.5, 96% CI 0.2–1.3, p>0.05	
					Non-fatal 12 month suicide ideation and plan (self-report as part of WHO Composite International Diagnostic Interview (CIDI))	Bivariate	Positive 12-month suicide ideation among total sample: OR=1.3, 95% CI 1.5–2.0, P<0.05 12-months suicide plan among 12-month ideators: OR=1.7, 95% CI 1.1–2.7, p<0.05	++
Grigoriev et al, 2013 ³	Belarus Community based (rural and urban)	Adolescents and adults (13-64 years old) n/a gender	Ecological study (n=n/a)	Relative poverty Proportion of people with income below the poverty line (Income and Expenditure of Households Sample Survey)	Fatal Number of completed suicides (National Committee of Statistics of Belarus)	Multivariate	Positive Males: beta=0.3, SE=0.0, p<0.01 Females: beta=0.03, SE=0.0, p<0.05	+
Economic status and wealth assets								
Dai et al, 2011 ⁴	China Community based (rural)	Adolescents and adults (16-34 years old) 53% female	Cross-sectional study (n=1654)	Economic status and wealth assets Perceived financial status (self-report)	Non-fatal Suicide attempt (self-report as part of National Comorbidity Survey)	Multivariate	Null OR = 3.26, 95% CI 0.98–10.83, p=0.1306	++

First author	Setting	Study population	Study design (sample size)	Poverty dimension	Suicide dimension ^a	Analysis	Association between poverty-suicide	Study quality ^b
				Economic status and wealth assets Perceived financial status (self-report)	Non-fatal Suicidal ideation, serious ideation, suicide plan (self-report as part of National Comorbidity Survey)	Multivariate	Positive Suicidal ideation: OR=2.93, 95% CI 1.82–4.71, p=0.0000 Serious ideation: OR=2.25, 95% CI 1.21–4.19, p=0.0017 Suicide plan: OR=2.15, 95% CI 1.04–4.41, p=0.0067	++
Gedela et al, 2008 ⁵	India Community based (rural)	n/a age, farmers n/a gender	Cross-sectional study (n=74)	Economic status and wealth assets	Fatal	Multivariate	Null OR= 0.9983149, SD=0.0009286, p=0.070	-
				Value of livestock (as reported by family)	Number of completed suicides (local legal death registers)			
				Economic status and wealth assets Value of agricultural produce (as reported by family)	Fatal Number of completed suicides (local legal death registers)	Multivariate	Null OR=1.000051, SD=0.0000403, p=0.209	-
Gong et al, 2011 ⁶	China Community based (rural)	Adolescents, adults and older people (13+ years old) 61% female	Cross-sectional study (n=3821)	Economic status and wealth assets	Non-fatal	Bivariate	Positive Severe suicidal ideation: OR 4.33, 95% CI 3.15–5.94, p<0.001	+
				Family economic status in the previous year, defined as good, fair or poor (self-report)	Six-months prevalence of suicidal thoughts, suicidal attempts or self-injury (self-report)			
				Economic status and wealth assets Family economic status in the previous year, defined as good, fair or poor (self-report)	Non-fatal Six-months prevalence of suicidal thoughts, suicidal attempts or self-injury (self-report)	Multivariate	Positive Severe suicidal ideation: OR 1.52; 95% CI 1.07–2.15, p=0.02	+
Kaur et al, 2010 ⁷	India Community based (rural)	n/a age, farmers n/a gender	Case-control study (n=120 families)	Economic status and wealth assets Income from dairy farming, income from non-farming sources, and income from crops (as reported by family)	Fatal Number of completed suicides (police records)	Bivariate	Positive Value of income from dairy: t=4.67, p<0.01 Value of non-farming income: t=3.98, p<0.01	-

First author	Setting	Study population	Study design (sample size)	Poverty dimension	Suicide dimension ^a	Analysis	Association between poverty-suicide	Study quality ^b
							Value of income from crops: $t=11.28, p < 0.05$	
Kinyanda et al, 2011 ⁸	Uganda Community based (rural)	Children, adolescents and adults (0-19 years old) 53% female	Cross-sectional study (n=1492)	Economic status and wealth assets Family's total income per month (in Uganda shillings) (self-report)	Non-fatal Suicidal ideation, self-harm and suicide attempt (MINI International Neuropsychiatric Interview for children and adolescents to measure adolescent suicidality)	Bivariate	Positive OR (95% CI) for family income less than 15,000: OR=1 Family income 15,000–99,000: OR=0.5, 95% CI 0.3–1.1 Family income more than 100,000: OR=0.3, 95% CI 0.1–0.9	++
Kong et al, 2010 ⁹	China Community based (rural)	Children and adults (13-64 years old) 47% female	Case-control study (n=740)	Economic status and wealth assets Annual Family income (as collected via psychological autopsy)	Fatal Number of completed suicides (official records)	Bivariate	Positive Suicide vs. control: $t= -3.79, p < 0.001$	++
Ma et al, 2009 ¹⁰	China Community based (rural and urban)	Adolescents, adults and older people (13+ years old) 54% female	Cross-sectional study (n=5926)	Economic status and wealth assets Monthly income (self-report)	Non-fatal Life-time prevalence of suicidal ideation and plans (self-report)	Bivariate	Null Suicidal ideation: OR=0.3, 95% CI 0.1–1.1, $p > 0.05$ Suicidal plans: OR=0.4, 95% CI 0.1–1.5, $p > 0.05$	++
				Economic status and wealth assets Monthly income (self-report)	Non-fatal Life-time prevalence of suicidal attempts (self-report)	Multivariate	Positive OR=0.2, 95% CI 0.06–0.6, $p < 0.05$	++
Manoranjitham et al, 2010 ¹¹	India Community based (rural)	Children, adolescents, adults and older people (n/a age) 41% female	Case-control study (n=200)	Economic status and wealth assets Monthly family income less than 2400 Indian Rupees (self-report)	Fatal Number of completed suicides (official suicide surveillance system)	Bivariate	Null OR=1.0, 95% CI 0.6–1.8, $p=0.89$	++
Mukhopadhyay et al, 2012 ¹²	India Community	Adolescents (13–18 years old)	Cross-sectional study	Economic status and wealth assets Perceived economic status (SES)	Non-fatal 12-month prevalence of suicide	Multivariate	Positive Suicidal ideation: OR=	-

First author	Setting	Study population	Study design (sample size)	Poverty dimension	Suicide dimension ^a	Analysis	Association between poverty-suicide	Study quality ^b
	based (rural and urban)	30% female	(n=2068)	was categorised as high (very well off/living comfortably) or low (just getting by/almost poor/poor) (self-report)	ideation and attempt (self-report)		2.23, 95% CI 1.62–3.06, p<0.05 Suicidal attempt: OR=2.92, 95% CI 1.63–5.21, p<0.05	
Polatöz et al, 2011 ¹³	Turkey Community based	Adolescents and adults (13–64 years old) 55% female	Cross-sectional study (n=1117)	Economic status and wealth assets Level of family income, classified as high, middle and low (Socio-demographic Information Form)	Non-fatal Suicidal ideation and intent (Suicidal Behaviour Questionnaire, Suicidal Intent Scale and Suicidal Ideation Scale)	Bivariate	Null Suicidal Behaviour Questionnaire : KW=2.97, p=0.61 Suicidal Intent Scale : p=0.98 Suicidal Ideation Scale : F=1.87, p=0.10	+
Sauvaget et al, 2009 ¹⁴	India Community based (rural)	Adults and older people (35+ years old) 62% female	Cohort study (n=131720)	Economic status and wealth assets Monthly household income (as reported by family)	Fatal Number of completed suicides (official death register)	Bivariate	Null Monthly income <1500 Rs: RR=1.00 (Reference) Monthly income 1500–3000 Rs: RR=0.94, 95% CI 0.74–1.18 Monthly income 3001–5000 Rs: RR=0.85, 95% CI 0.61–1.20 Monthly income >5000: RR=0.63, 95% CI 0.40–1.00	+
				Economic status and wealth assets Monthly household income (as reported by family)	Fatal Number of completed suicides (official death register)		Multivariate Null Monthly income <1500 Rupees (RR): RR=1.00 (Reference) Monthly income 1500–	

First author	Setting	Study population	Study design (sample size)	Poverty dimension	Suicide dimension ^a	Analysis	Association between poverty-suicide	Study quality ^b
							3000 Rs: RR=1.06, 95% CI 0.84–1.35 Monthly income 3001–5000 Rs: RR=1.15, 95% CI 0.80–1.65 Monthly income >5000: RR=0.97, 95% CI 0.59–1.60	
Tran Thi Thanh et al, 2006 ¹⁵	Vietnam Community based (urban)	Adolescents, adults and elderly people (13+ years old) 52% female	Cross-sectional study (n=2280)	Economic status and wealth assets Socio-economic status classified as high or low on the basis of mean monthly family income (self-report)	Non-fatal Lifetime and 12-month prevalence of prevalence suicidal thoughts (self-report in response to SUPRE-MISS community survey questionnaire)	Bivariate	Positive Low income and life-time prevalence of suicidal ideation: OR=1.9, 95% CI 1.4–2.7, p<0.1	++
				Economic status and wealth assets Socio-economic status classified as high or low on the basis of mean monthly family income (self-report)	Non-fatal Lifetime and 12-month prevalence of prevalence suicidal thoughts (self-report in response to SUPRE-MISS community survey questionnaire)	Multivariate	Positive Low income and life-time prevalence of suicidal ideation: OR=1.7, 95% CI 1.1–2.6, p<0.1	++
Toprak et al, 2011 ¹⁶	Turkey Community based (rural and urban)	Adolescents and adults (13-64 years old), students 54% female	Cross-sectional study (n=636)	Economic status and wealth assets Level of income, classified as low or high (self-report)	Non-fatal Life time prevalence of suicidal ideation (self-report)	Bivariate	Null Low income: OR=0.69, 95% CI 0.39–1.23, p>0.05	+
				Economic status and wealth assets Level of income, classified as low or high (self-report)	Non-fatal Life time prevalence of suicide attempt (self-report)	Bivariate	Positive Low income: OR=2.22, 95% CI 1.13–4.34, p<0.05	+
				Economic status and wealth assets Level of income, classified as low or high (self-report)	Non-fatal Life time prevalence of self-harm (self-report)	Multivariate	Positive Low income: adjusted OR=2.10; 95% CI 1.07–4.12, p=0.02	+

First author	Setting	Study population	Study design (sample size)	Poverty dimension	Suicide dimension ^a	Analysis	Association between poverty-suicide	Study quality ^b
Toros et al, 2004 ¹⁷	Turkey School based (rural and urban)	Children, adolescents and adults (10-20 years old) n/a gender	Cross-sectional study (n=4143)	Economic status and wealth assets Family monthly income (self-report)	Non-fatal Suicide attempt (self-report)	Bivariate	Null Suicide attempters vs. non suicide attempters: t=0.619, p=0.536	+
Wan et al, 2011 ¹⁸	China School based (urban)	Adolescents (13-18 years old) 51% female	Cross-sectional study (n=17622)	Economic status and wealth assets Perceived family economic status (self-report)	Non-fatal 12-month prevalence of self-harm (self-report)	Bivariate	Positive Lower socio-economic status and single incidents of self-harm: OR=1.10, 95% CI 0.84–1.45, p=0.496 Lower socio-economic status and repeat incidents of self-harm: OR=1.36, 95% CI 1.15–1.61, p<0.001	++
Zhang et al, 2006 ¹⁹	China Hospital based (urban)	n/a age 46% female	Case-control study (n=166)	Economic status and wealth assets Perception of socioeconomic status (self-report)	Non-fatal Suicide attempt (Semi-structured questionnaire including 8 questions selected from Beck's Suicidal Intent Scale)	Bivariate	Positive Low socioeconomic status: Pearson score r=1.98, p<0.05	-
Unemployment								
Ahmadi et al, 2009 ²⁰	Iran Hospital based (rural and urban)	n/a age 87% female	Case-control study (n=60)	Unemployment Employment status (self-report)	Non-fatal Hospital admission following intentional self-burning (hospital records)	Multivariate	Null OR=0.58, 95% CI 0.11–3.20, p=0.53	++
Aliverdinia et al, 2009 ²¹	Iran Community based (urban)	n/a age 100% female	Ecological study (n=100)	Unemployment Unemployment rate among working aged females (official statistics)	Fatal Number of completed suicides (Women's Participation Centre Records)	Multivariate	Positive Labour force participation: r= -0.38, p<0.01	-
Almasi et al, 2009 ²²	Hungary Urban and rural	Adults (36-55 years old) 68% female	Case-control study (n=388)	Unemployment Employment status (police records)	Fatal Number of completed suicides (police records)	Bivariate	Positive OR=7.75, 95% CI 2.74–21.95, p<0.001	++

First author	Setting	Study population	Study design (sample size)	Poverty dimension	Suicide dimension ^a	Analysis	Association between poverty-suicide	Study quality ^b
Borges et al, 2010 ^{2,c}	21 countries Community based (rural and urban)	Adults (n/a age) n/a gender	Cross-sectional study (n=108705)	Unemployment	Non-fatal	Bivariate	Null	++
				Employment status (self-report as part of WHO Composite International Diagnostic Interview)	12 month suicide plan and suicidal ideation (self-report as part of WHO CIDI)		12-month suicide plan among 12-month ideators in developing countries: OR=1.0, 95% CI 0.7-1.4, p>0.05	
				Unemployment	Non-fatal	Bivariate	Positive	++
				Employment status (self-report as part of WHO Composite International Diagnostic Interview)	12-month suicide ideation, and attempt (self-report as part of WHO Composite International Diagnostic Interview)		12-month suicide ideation among total sample: OR=1.5, 95% CI 1.3-1.9, P<0.05 Unplanned suicidal attempt among 12-month ideators: OR=0.5, 95% CI 0.2-1.2, p<0.05	
Ekramzadeh et al, 2012 ²³	Iran Hospital based	Adults and older people (19+ years old), medically ill 39% female	Cross-sectional study (n=650)	Unemployment	Non-fatal	Bivariate	Null	+
				Employment status (self-report)	Non-fatal suicidal behaviours (self-report in response to the Harmful Behaviour Scale)		Unemployment: r=0.056, p>0.05	
				Unemployment	Non-fatal	Multivariate	Null	+
				Employment status (self-report)	Non-fatal suicidal behaviours (self-report in response to the Harmful Behaviour Scale)		Unemployment	
				Unemployment	Non-fatal	Bivariate	Positive	+
				Employment status (self-report)	Non-fatal suicidal behaviours (self-report in response to Beck Scale for Suicidal Ideation Scale)		Unemployment: r=0.140, p<0.01	
				Unemployment	Non-fatal	Multivariate	Null	+
				Employment status (self-report)	Non-fatal suicidal behaviours (self-report in response to Beck Scale for Suicidal Ideation Scale)		Unemployment	

First author	Setting	Study population	Study design (sample size)	Poverty dimension	Suicide dimension ^a	Analysis	Association between poverty-suicide	Study quality ^b
Grigoriev et al, 2013 ³	Belarus Community based (rural and urban)	Adolescents and adults (13-64 years old) n/a gender	Ecological study (n=n/a)	Unemployment Unemployment rate (official statistics)	Fatal Number of completed suicides (National Committee of Statistics of Belarus)	Multivariate	Unclear Males: beta=2.8, SE=0.8, p<0.05 Females: beta=0.4, SE=0.2, p>0.1	+
Gururaj et al, 2004 ²⁴	India Community based (urban)	Children, adolescents, adults and older people (n/a age) 33% female	Case-control study (n=538)	Unemployment	Fatal	Bivariate	Positive	-
				Employment status (as collected via psychological autopsy with family members)	Number of completed suicides (police records)		Unemployment: OR=6.15, 96% CI 3.28-11.55, p<0.001	
				Unemployment	Fatal	Multivariate	Null	-
				Employment status (as collected via psychological autopsy with family members)	Number of completed suicides (police records)		Unemployment	
Khan et al, 2008 ²⁵	Pakistan Community based	n/a age 17% female	Case-control study (n=200)	Unemployment Employment status (as collected via psychological autopsy with friends or family members)	Fatal Number of completed suicides (police records)	Bivariate	Positive Unemployment: OR=3.0, 95% CI 1.1-8.2	+
Manoranjitham et al, 2010 ¹¹	India Community based (rural)	Children, adolescents, adults and older people (n/a age) 41% female	Case-control study (n=200)	Unemployment Employment status (self-report)	Fatal Number of completed suicides (official suicide surveillance system)	Bivariate	Null Unemployment: Fisher's exact test p= 0.49	++
Manuel et al, 2008 ²⁶	Sri Lanka Hospital based (rural)	Adolescents and adults (13-64 years old) n/a gender	Ecological study (n=189)	Unemployment Unemployment rate (official statistics)	Fatal Number of completed suicides (hospital records)	Multivariate	Null Unemployment: IRR= 1.29, 95% CI 0.96-1.72, p=0.147 Attempted and completed suicides reported as one group.	+
				Unemployment Unemployment rate (official statistics)	Non-fatal Hospital admission for suicide attempt (hospital records)	Multivariate	Null Unemployment: IRR= 1.29, 95% CI 0.96-1.72,	+

First author	Setting	Study population	Study design (sample size)	Poverty dimension	Suicide dimension ^a	Analysis	Association between poverty-suicide	Study quality ^b
							p=0.147 Attempted and completed suicides reported as one group.	
Nojomi et al, 2007 ²⁷	Iran Community based (urban)	Children, adolescents, adults and older people (n/a age) 65% female	Cross-sectional study (n=2300)	Unemployment Employment status (self-report)	Non-fatal Suicide ideation, suicide plans, suicide attempts (WHO SUPRE-MISS questionnaire with specific questions on suicide and related factors)	Bivariate	Positive Unemployment: Chi-square (p=0.02)	+
				Unemployment Employment status (self-report)	Non-fatal Suicide ideations, suicide plans, suicide attempts (WHO SUPRE-MISS questionnaire with specific questions on suicide and related factors)	Multivariate	Positive Unemployment: OR=2.538, 95% CI 1.078–5.977, p=0.033	+
Ovuga et al, 2005 ²⁸	Uganda Community based (rural)	Adults and older people (19+ years old) 33% female	Cross-sectional study (n=939)	Unemployment Employment status (self-report)	Non-fatal Life-time and one-week prevalence of suicidal ideation (Beck Scale for Suicide Ideation)	Bivariate	Unclear Lifetime experience of suicide ideation and being peasant farmer: OR=1.95, 95% CI 1.08–3.71 Past week experience of suicide ideation and being peasant farmer: OR=1.40, 95% CI 0.62–3.70 BSS score >10 and being peasant farmer: OR=1.05, 95% CI 0.56–2.09	++
Thanh et al, 2006 ¹⁶	Vietnam Community based (urban)	Adolescents, adults and older people (13+ years old)	Cross-sectional study (n=2280)	Unemployment Employment status (self-report)	Non-fatal Lifetime and 12-month prevalence of prevalence	Bivariate	Null Life-time prevalence of suicidal ideation: OR=1.2,	++

First author	Setting	Study population	Study design (sample size)	Poverty dimension	Suicide dimension ^a	Analysis	Association between poverty-suicide	Study quality ^b
		52% female			suicidal thoughts (self-report in response to SUPRE-MISS community survey questionnaire)		95% CI 0.4–4.2, p>0.05	
Economic/financial problems								
Borges et al, 2010 ^{3,c}	21 countries Community based (rural and urban)	Adults (n/a age) n/a gender	Cross-sectional study (n=108705)	Economic/ financial problems	Non-fatal	Bivariate	Null	++
				Economic adversity (self-report as part of WHOCIDI)	12 month planned and unplanned suicide attempt, suicide plan and suicidal ideation (self-report as part of WHO Composite International Diagnostic Interview)		12-month planned suicide attempt among 12-month ideators: OR=0.4, 95% CI 0.1–1.3, P>0.05 12-month unplanned suicide attempt among 12-month ideators: OR=0.5, 95% CI 0.1–4.8, p>0.05 12-month suicide plans among 12-month ideators: OR=1.0, 95% CI 0.5–2.3, p>0.05	
				Economic/ financial problems	Non-fatal	Bivariate	Positive	++
				Economic adversity (self-report as part of WHO CIDI)	12 month suicide ideation (self-report as part of WHO Composite International Diagnostic Interview)		12-month suicide ideation among total sample: OR 1.7, P<0.05	
Gururaj et al, 2004 ²⁴	India Community based (urban)	Children, adolescents, adults and older people (n/a age) 33% female	Case-control study (n=538)	Economic/ financial problems Sudden economic bankruptcy; chronic financial problems; poverty in last 12 months and poverty since childhood (as collected via psychological autopsy with family members)	Fatal Number of completed suicides (police records)	Bivariate	Unclear Financial problems: OR=2.07; 95% CI 1.43–3.01, p=0.001 Sudden economic bankruptcy: OR=7.13, 95% CI 3.62–14.72, p<0.001 Poverty in recent past:	-

First author	Setting	Study population	Study design (sample size)	Poverty dimension	Suicide dimension ^a	Analysis	Association between poverty-suicide	Study quality ^b
							OR=2.41, 95% CI 1.51–3.86, p<0.001 Chronic financial problems: OR=1.31, 95% CI 0.92–1.86, p>0.05 Poverty since childhood: OR=1.72, 95% CI 1.05–2.82, p>0.05	
Hong et al, 2007 ²⁹	China Community based (rural)	Children, adolescents, adults and older people (n/a age), sex workers 100% female	Cross-sectional study (n=454)	Economic/ financial problems Financial concerns (self-report)	Non-fatal Six-month prevalence of suicidal ideation or suicidal attempt among sex workers (self-report)	Multivariate	Positive Becoming a female sex worker because of financial needs: OR=0.24, 95% CI 0.09–0.58, p<0.01	+
Khan et al, 2008 ²⁵	Pakistan Community based	n/a age 17% female	Case-control study (n=200)	Economic/ financial problems Financial difficulties (as collected via psychological autopsy with friends or family members)	Fatal Number of completed suicides (police records)	Bivariate	Positive OR=3.2, 95% CI 1.3–8.0	+
Manoranjitham et al, 2010 ¹¹	India Community based (rural)	Children, adolescents, adults and older people (n/a age) 41% female	Case-control study (n=200)	Economic/ financial problems History of recent major financial crisis (self-report)	Fatal Number of completed suicides (official suicide surveillance system)	Bivariate	Null OR=2.4, 95% CI 0.8–7.0, p=0.13	++
Nath et al, 2012 ³⁰	India Community based (urban)	Adolescents and adults (13-64 years old), students 61% female	Cross-sectional study (n=1817)	Economic/ financial problems Perceived level of stress due to economic circumstances (self-report)	Non-fatal Suicidal ideation or suicidal attempt (self-report)	Multivariate	Positive Suicide ideation: OR=1.17, 95% CI 1.11–1.24, p<0.001 Lifetime suicide attempt: OR=1.19; , 95% CI 1.08–1.31, p<0.001	+
Xie et al, 2012 ³¹	China Hospital based	Adolescents, adults and elderly people (13+ years old), patients with systemic lupus erythematosus	Cross-sectional study (n=285)	Economic/ financial problems Financial burden of having lupus (categorised as no, low, moderate, and heavy burden) (self-report)	Non-fatal Life-time and 12-month prevalence of suicidal ideation (Beck Depression Inventory,	Bivariate	Positive OR=1.625, 95% CI 1.245–2.121, p<0.001	++

First author	Setting	Study population	Study design (sample size)	Poverty dimension	Suicide dimension ^a	Analysis	Association between poverty-suicide	Study quality ^b
		94% female			Family APGAR and Trait Coping Style Questionnaire)			
				Economic/ financial problems	Non-fatal	Multivariate	Null	++
				Financial burden of having lupus (categorised as no, low, moderate, and heavy burden) (self-report)	Life-time and 12-month prevalence of suicidal ideation (Beck Depression Inventory, Family APGAR and Trait Coping Style Questionnaire)			
Debt								
Gedela et al, 2008 ³	India Community based (rural)	n/a age, farmers n/a gender	Cross-sectional study (n=74)	Debt Outstanding debt per hectare (as reported by family)	Fatal Number of completed suicides (local legal death registers)	Multivariate	Null OR=1.000026, SD=0.0000247, p=0.283	-
Gururaj et al, 2004 ²⁴	India Community based (urban)	Children, adolescents, adults and older people (n/a age) 33% female	Case-control study (n=538)	Debt Presence of large loan (as collected via psychological autopsy with family members)	Fatal Number of completed suicides (police records)	Bivariate	Positive OR=4.12, 96% CI 2.04–8.48, p<0.001	-
Kaur et al, 2010 ⁷	India Community based (rural)	n/a age, farmers n/a gender	Case-control study (n=120 families)	Debt Total loan outstanding (as reported by family)	Fatal Number of completed suicides (police records)	Bivariate	Positive Debt of Rupees 144 220 vs Rupees 29 363: t=7.09, p<0.01	-
Support from the welfare system								
Aliverdina et al, 2009 ²¹	Iran Community based (urban)	n/a age 100% female	Ecological study (n=100)	Support from the welfare system Percentage of the population receiving support from the Iranian welfare system (official statistics)	Fatal Number of completed suicides (Women's Participation Centre Records)	Multivariate	Positive r= -0.58, p<0.01	-
Country level								
National income								
Altinanahar et al, 2009 ³²	Turkey Community based (rural and urban)	n/a age n/a gender	Economic modelling (n=n/a)	National income Per capita real income (official statistics)	Fatal Number of completed suicides (official records)	Multivariate	Positive Long-run elasticity of suicide, with respect to income: -0.41	+

First author	Setting	Study population	Study design (sample size)	Poverty dimension	Suicide dimension ^a	Analysis	Association between poverty-suicide	Study quality ^b
							Short-run elasticity of suicide, with respect to income: -0.19	
Bando et al, 2012 ³³	Brazil Community based (rural and urban)	Adolescents, adults and older people (15+ years old) 20% female	Interrupted-time series (n=98904)	National income GDP per capita (official statistics)	Fatal Number of completed suicides (death registry databases)	Bivariate	Unclear Area 1 – wealthiest (Brazil): RR=2.59, 95% CI 1.840–3.669, p<0.01 Area 2 - mid-income (city of São Paulo): RR=1.07, 95% CI 0.370–0.671 Area 3 – poorest (state of São Paulo): RR=0.49, 95% CI 1.031–1.108	-
Blasco-Fontecilla et al, 2012 ³⁴	56 countries Community based (rural and urban)	n/a age n/a gender	Interrupted-time series (n=n/a)	National income PPP-adjusted GDP per capita (as obtained from the World Bank official statistics)	Fatal Suicide rate (WHO mortality database)	Bivariate	Negative (p-s+) Latin-American and Caribbean (AMR B): r=0.371, 95% CI 0.347–0.393, p=0.001 Latin-American and Caribbean (AMR D): r=0.814, 95% CI 0.763–0.855, p=0.001 Southeast Asian countries (SEAR D): r=0.763, 95% CI 0.754–0.771, p=0.001 Western Pacific Region (WPR B): r=0.872, 95% CI 0.858–0.886, p<0.001 African countries (AFR D): r=0.278, 95% CI 0.213–0.339, p=0.55	+
Botha et al, 2012 ³⁵	South Africa	Adolescents, adults	Economic	National income	Fatal	Bivariate	Positive	++

First author	Setting	Study population	Study design (sample size)	Poverty dimension	Suicide dimension ^a	Analysis	Association between poverty-suicide	Study quality ^b
	Community based (rural and urban)	and older people (15-96 years old) n/a gender	modelling (n=1659)	Inflation rate in each region as a proxy for economic performance (official statistics)	Number of completed suicides (official death notification)		p<0.05	
				National income Inflation rate in each region as a proxy for economic performance (official statistics)	Fatal Number of completed suicides (official death notification)	Multivariate	Unclear Males: p=0.518 Females: p<0.1	++
Faria et al, 2006 ³⁶	Brazil Community based (peri-urban)	Adolescents, adults and older people (13+ years old) 20% female	Ecological study (n=4766)	National income Per capita GDP (official statistics)	Fatal Number of completed suicides (official records of cause of death)	Multivariate	Null Males: r=-0.06, 95% CI -1.72-1.85, p>0.05 Females: adjusted r=-0.08, 95% CI 0.42-0.58, p>0.06	+
Pandey et al, 2009 ³⁷	India Community based (rural and urban)	n/a age n/a gender	Economic modelling (n=n/a)	National income GDP per capita (official statistics)	Fatal National rate of completed suicide (official records)	Multivariate	Unclear Positive association between suicide rate and GDP per capita growth rate (no value reported)	++
Zhang et al, 2010 ³⁸	China Community based (rural and urban)	n/a age n/a gender	Interrupted-time series (n=n/a)	National income Per capita GDP adjusted for inflation (official statistics)	Fatal National rates of completed suicides (Official records)	Multivariate	Positive Negative correlation between per capita GDP and suicide rates at a macro level. Illustrated graphically but no value reported. Urban income: beta= -0.5724, SE=0.2006, z= -2.85, p=0.004 Rural income: beta= -0.6818, SE=0.0555, z= -12.28, p=0.000 Urban and rural income:	-

First author	Setting	Study population	Study design (sample size)	Poverty dimension	Suicide dimension ^a	Analysis	Association between poverty-suicide	Study quality ^b
							beta= -0.4640, SE=0.1116, z= -4.16, p=0.000	
Composite poverty measure								
Faria et al, 2006 ³⁶	Brazil Community based (peri-urban)	Adolescents, adults and older people (13+ years old) 20% female	Ecological study (n=4766)	Composite poverty measure HDI-income (official statistics)	Fatal Number of completed suicides (official records of cause of death)	Multivariate	Null Males: r=-0.16, 95% CI -0.60-0.92, p>0.05 Females: adjusted r= -0.13, 95% CI -0.32-0.06, p>0.05	+

Note: n/a Not available. ^a Suicide dimensions: fatal refers to completed suicide, non-fatal includes all remaining suicidal ideations and behaviours (ideation, plan, attempt, self-harm). ^b Study quality: high (++), acceptable (+), low (-). ^c Additional data in the Appendix tables available here <http://www.hcp.med.harvard.edu/ncs/publications.php#date2010> (accessed April 8, 2016).

References

- 1 World Bank. Country and Lending Groups. Washington DC: World Bank Group, 2013. <http://data.worldbank.org/about/countryclassifications/country-and-lending-groups> [accessed April 1, 2014].
- 2 Borges G, Nock MK, Haro Abad JM, et al. Twelve-month prevalence of and risk factors for suicide attempts in the World Health Organization world mental health surveys. *J Clin Psychiatry* 2010; 71: 1617–28.
- 3 Grigoriev P, Doblhammer-Reiter G, Shkolnikov V. Trends, patterns, and determinants of regional mortality in Belarus, 1990–2007. *Popul Stud (Camb)* 2013; 67: 61–81.
- 4 Dai J, Chiu HF, Conner KR, et al. Suicidal ideation and attempts among rural Chinese aged 16–34 years—Socio-demographic correlates in the context of a transforming China. *J Affect Disord* 2011; 130: 438–46.
- 5 Gedela SPR. Factors responsible for agrarian crisis in Andhra Pradesh (a logistic regression analysis). *World Applied Sciences Journal* 2008; 4: 707–13.
- 6 Gong YH, Zhang L, Wang ZQ, Liang Y. Pathway analysis of risk factors for severe suicidal ideation: a survey in rural China. *Can J Public Health* 2011; 102: 472–75.
- 7 Kaur P, Dhaliwal HS, Singh SY. Farmers' suicides in Punjab: a discriminant analysis approach. *Indian J Econ* 2011; 91: 543–50.
- 8 Kinyanda E, Kizza R, Levin J, Ndyabangi S, Abbo c. Adolescent suicidality as seen in rural northeastern Uganda: prevalence and risk factors. *Crisis* 2011; 32: 43–51.
- 9 Kong Y, Zhang J. Access to farming pesticides and risk for suicide in Chinese rural young people. *Psychiatry Res* 2010; 179: 217–21.
- 10 Ma X, Xiang TY, Cai ZJ, et al. Lifetime prevalence of suicidal ideation, suicide plans and attempts in rural and urban regions of Beijing, China. *Aust N Z J Psychiatry* 2009; 43: 158–66.
- 11 Manoranjitham SD, Rajkumar AP, Thangadurai P, Prasad J, Jayakaran R, Jacob KS. Risk factors for suicide in rural south India. *Br J Psychiatry* 2010; 196: 26–30.
- 12 Mukhopadhyay DK, Mukhopadhyay S, Sinhababu A, Biswas AB. Are the adolescent behaviors too risky? A school-based study in a district of west Bengal, India. *J Trop Pediatr* 2012; 58: 496–500.
- 13 Polatöz O, Kugu N, Dogan O, et al. The prevalence of suicidal behaviour and its correlation with certain sociodemographic variables in Sivas province. *Dusunen Adam* 2011; 24: 13–23.
- 14 Sauvaget C, Ramadas K, Fayette JM, Thomas G, Thara S, Sankaranarayanan R. Completed suicide in adults of rural Kerala: rates and determinants. *Natl Med J India* 2009; 22: 228–33.
- 15 Tran Thi Thanh H, Tran TN, Jiang GX, Leenaars A, Wasserman D. Life time suicidal thoughts in an urban community in Hanoi, Vietnam. *BMC Public Health* 2006; 6: 76.
- 16 Toprak S, Cetin I, Guven T, Can G, Demircan C. Self-harm, suicidal ideation and suicide attempts among college students. *Psychiatry Res* 2011; 187: 140–44.
- 17 Toros F, Bilgin NG, Sasmaz T, Bugdayci R, Camdeviren H. Suicide attempts and risk factors among children and adolescents. *Yonsei Med J* 2004; 45: 367–74.
- 18 Wan YH, Hu CL, Hao JH, Sun Y, Tao FB. Deliberate self-harm behaviors in Chinese adolescents and young adults. *Eur Child Adolesc Psychiatry* 2011; 20: 517–25.
- 19 Zhang J, Jia SH, Jiang C, Sun J. Characteristics of Chinese suicide attempters: an emergency room study. *Death Stud* 2006; 30: 259–68.
- 20 Ahmadi A, Mohammadi R, Schwebel DC, Khazaie H, Yeganeh N, Almasi A. Demographic risk factors of self-immolation: a case-control study. *Burns* 2009; 35: 580–86.
- 21 Aliverdina A, Pridemore WA. Women's fatalistic suicide in Iran: a partial test of Durkheim in an Islamic republic. *Violence Against Women* 2009; 15: 307–20.
- 22 Almasi K., Belso N, Kapur N, et al. Risk factors for suicide in Hungary: a case-control study. *BMC Psychiatry* 2009; 9: 45.
- 23 Ekramzadeh S, Javadpour A, Draper B, Mani A, Withall A, Sahraian A. Prevalence and correlates of suicidal thought and selfdestructive behavior among an elderly hospital population in Iran. *Int Psychogeriatr* 2012; 24: 1402–08.
- 24 Gururaj G, Isaac MK, Subbakrishna DK, Ranjani R. Risk factors for completed suicides: a case-control study from Bangalore, India. *Inj Control Saf Promot* 2004; 11: 183–91.
- 25 Khan MM, Mahmud S, Karim MS, Zaman M, Prince M. Case-control study of suicide in Karachi, Pakistan. *Br J Psychiatry* 2008; 193: 402–05.
- 26 Manuel C, Gunnell DJ, van der Hoek W, Dawson A, Wijeratne IK, Konradsen F. Self-poisoning in rural Sri Lanka: small-area variations in incidence. *BMC Public Health* 2008; 8: 26.
- 27 Nojomi M, Malakouti SK, Bolhari J, Poshtmashhadi M. A predictor model for suicide attempt: evidence from a population-based study. *Arch Iran Med* 2007; 10: 452–58.

- 28 Ovuga, E, Boardman J, Wassermann DY. Prevalence of suicide ideation in two districts of Uganda. *Arch Suicide Res* 2005; 9: 321–32.
- 29 Hong Y, Li X, Fang X, Zhao R. Correlates of suicidal ideation and attempt among female sex workers in China. *Health Care Women Int* 2007; 28: 490–505.
- 30 Nath Y, Paris J, Thombs B, Kirmayer L. Prevalence and social determinants of suicidal behaviours among college youth in India. *Int J Soc Psychiatry* 2012; 58: 393–99.
- 31 Xie LF, Chen PL, Pan HF, et al. Prevalence and correlates of suicidal ideation in SLE inpatients: Chinese experience. *Rheumatol Int* 2012; 32: 2707–14.
- 32 Altinanahtar, A, Halicioglu F. A dynamic econometric model of suicides in Turkey. *J Socio Econ* 2009; 38: 903–07.
- 33 Bando DH, Brunoni AR, Benseñor IM, Lotufo PA. Suicide rates and income in São Paulo and Brazil: a temporal and spatial epidemiologic analysis from 1996 to 2008. *BMC Psychiatry* 2012; 12: 127.
- 34 Blasco-Fontecilla H, Perez-Rodriguez MM, Garcia-Nieto R, et al. Worldwide impact of economic cycles on suicide trends over 3 decades: differences according to level of development. A mixed effect model study. *BMJ Open* 2012; 2: e000785.
- 35 Botha F. The Economics of Suicide in South Africa. *S Afr J Econ* 2012; 80: 526–52.
- 36 Faria NM, Victora CG, Meneghel SN, de Carvalho LA, Falk JW. Suicide rates in the State of Rio Grande do Sul, Brazil: association with socioeconomic, cultural, and agricultural factors. *Cad Saude Publica* 2006; 22: 2611–21.
- 37 Pandey MK, Kaur C. Investigating suicidal trend and its economic determinants: Evidence from India. ASARC Working Paper 2009-08. Canberra: Australia South Asia Research Center, 2009.
- 38 Zhang J, Ma J, Jia C, et al. Economic growth and suicide rate changes: a case in China from 1982 to 2005. *Eur Psychiatry* 2010; 25: 159–63.