

Risk factors for suicidal behaviour in developed and developing nations

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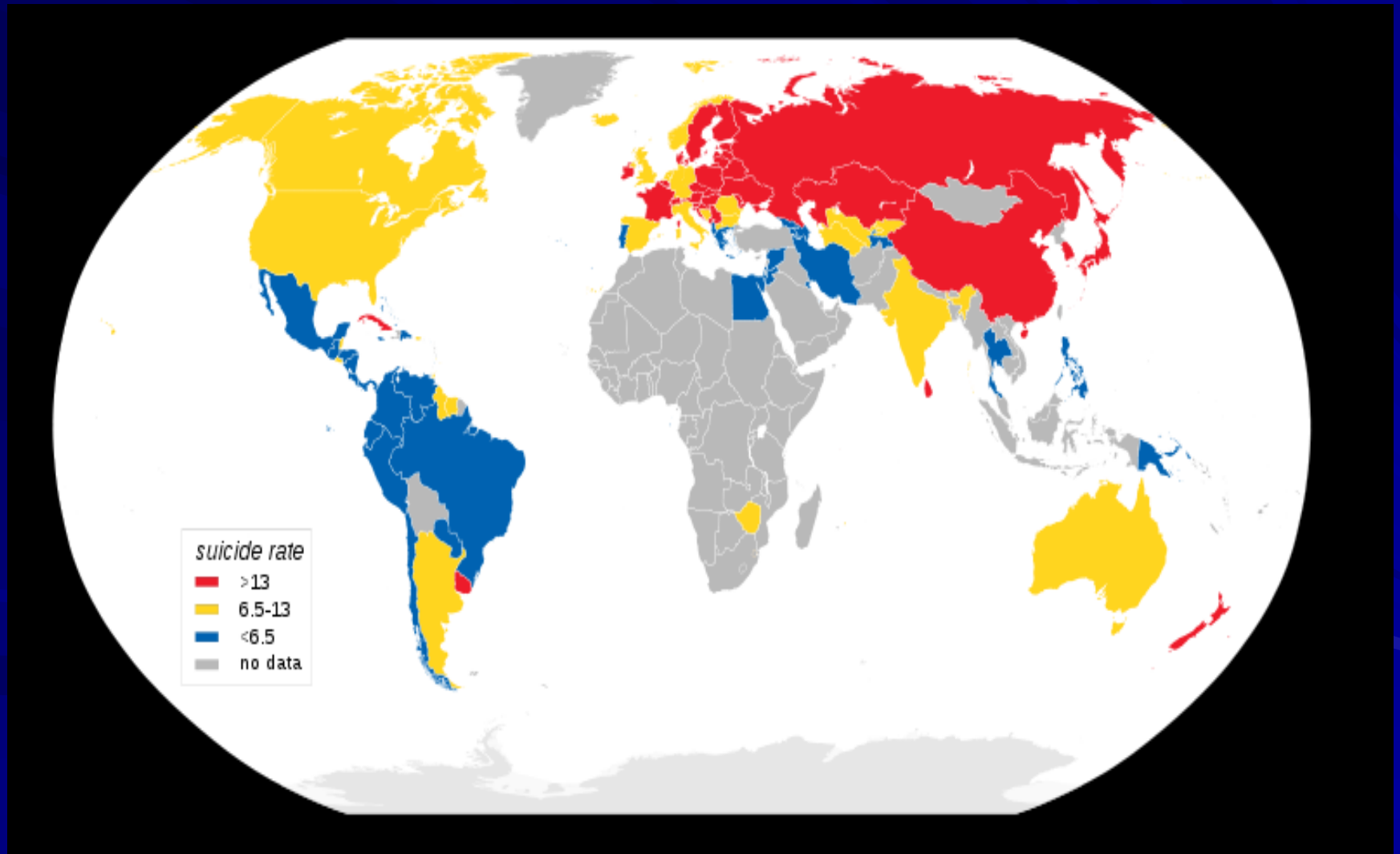
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Outline

- Global burden and distribution of suicide
- Epidemiology of suicide in China
- Pesticides: the toll
- Risk factors for suicide: the Western model
- Psychological autopsy
- Importance of psychiatric disorders and other risk factors in suicide: case studies (developing countries)
- Stereotype and reality of suicide in developing countries
- Tackling the pesticide problem
- Implications for suicide prevention

Suicide rates across the world



Global burden and distribution of suicide

- ~900,000 suicides p.a. worldwide (16/100,000)
- ~85% estimated to occur in low- and middle-income countries
- ~287,000 suicides in China (rate 23/100,000)
- ~110,000 suicides in India (rate 11/100,000)
- Among 10-24 yr olds worldwide suicide is 5th leading cause of death
- However, the global burden of suicide likely to be underestimated: for ~70% of global population recent accurate and comprehensive death registration data are not available
 - Most living in developing countries in Africa, Asia and SA
 - >50 non-reporting countries where majority of population is Muslim
 - Stigma of mental illness and criminalisation of suicide likely to lead to gross under-reporting of suicide

Suicide in China: epidemiology (1)

- Phillips (2002) estimates a mean annual suicide rate of 23/100,000 (n=287,000)
 - This estimate lower than those in GBD study and WHO study (>30/100,000)
- 5th most important cause of death overall
- Leading cause of death among 15-34 year olds (accounting for 19% of all deaths)
- Rate is (at least) 25% higher among women than among men
- Rates in rural areas three times higher than rates in urban areas

Suicide in China: epidemiology (2)

- Explanations for the high rate and distinctive patterning of suicide include:
 - Low status and limited opportunities for rural women (but this pattern found in many developing countries which do show same epidemiological picture)
 - No strong religious/legal/moral prohibitions against suicide, leading to greater acceptability of suicide among those suffering from psychiatric illness or faced with major stressors
 - In absence of psychiatric illness acute stressors may lead to impulsive suicidal behaviour, especially among rural young women with poor social support
 - Ready availability of toxic pesticides and lack of trained medical personnel, resulting in high case fatality rate (not linked to intention to die)

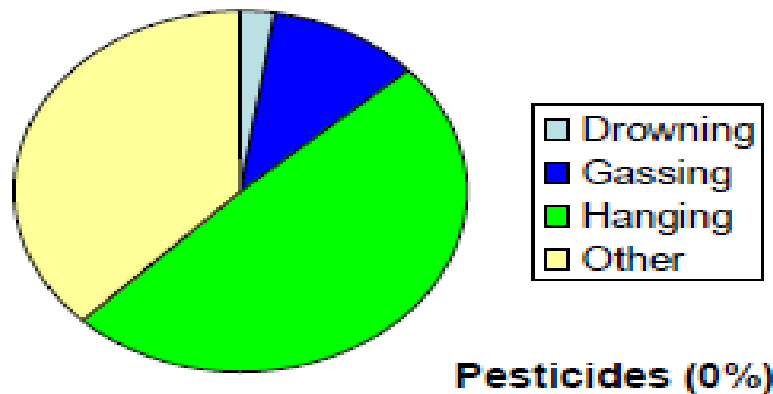
Pesticides: the toll

- Gunnell et al (2007) estimate that there are 258,000 (range 234,000-326,000) suicide deaths p.a. by pesticide poisoning worldwide, accounting for 30% (range 27-37%) of suicides globally
- Most of these in low- and middle-income countries (especially rural Asia)
- Estimated that 60-90% of suicides in China, Malaysia, Sri Lanka and Trinidad & Tobago by pesticide (cf 4% in European region)
- Pesticides massively increase case fatality rate
 - Case fatality of poisoning in UK: ~0.5%
 - Case fatality of poisoning in Asia: ~10-20%

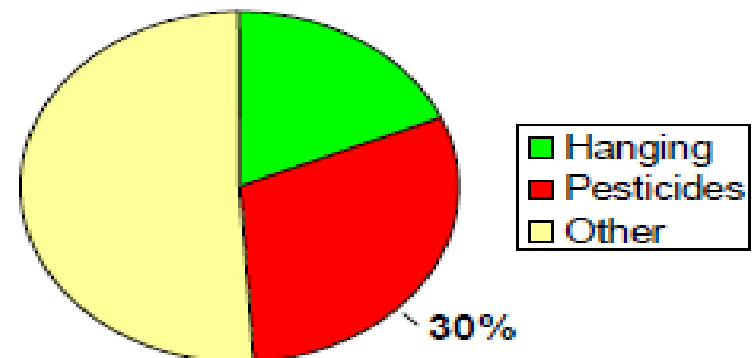
Pesticide poisoning, selected countries

Pesticide poisoning: an important method of fatal self-harm

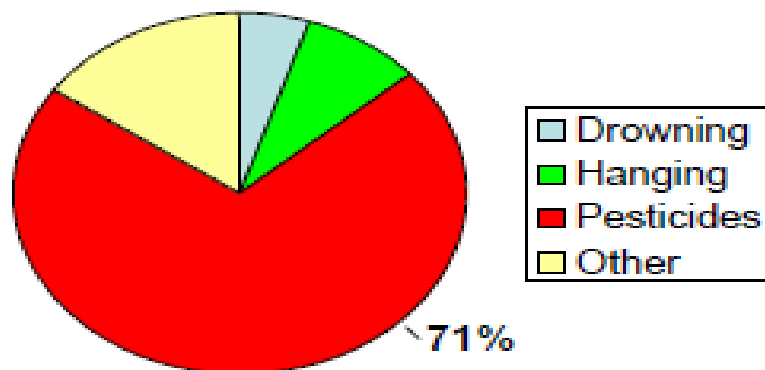
England and Wales, 2000



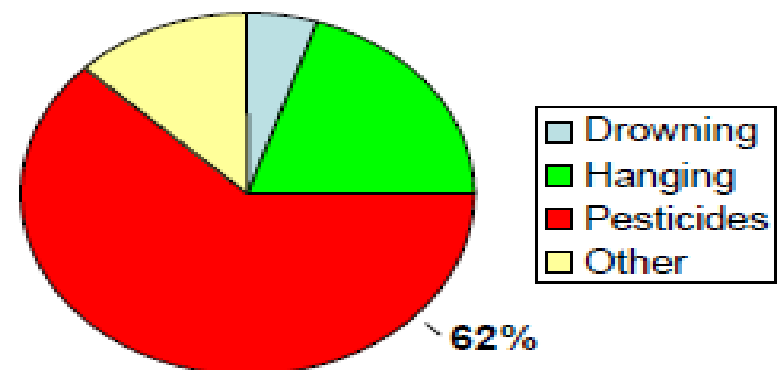
India (Andhra Pradesh), 1999



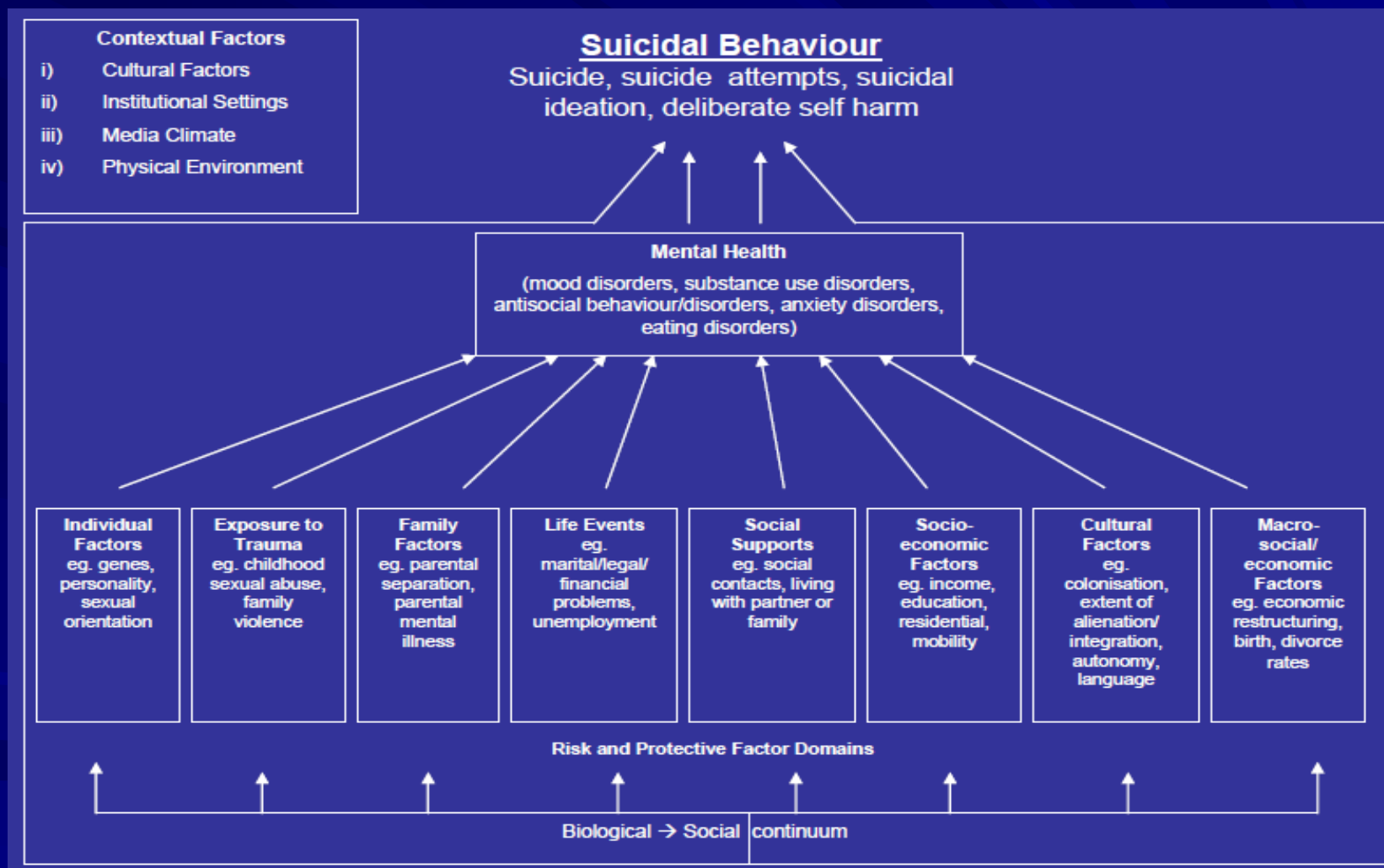
Sri Lanka (Jaffna), 1980-89



China, 1998-2000



Pathways to suicidal behaviour





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Risk Factors for Suicide

• Psychiatric Disorders

At least 90 percent of people who kill themselves have a diagnosable and treatable psychiatric illnesses -- such as major depression, bipolar depression, or some other depressive illness, including:

Schizophrenia

Alcohol or drug abuse, particularly when combined with depression

Posttraumatic Stress Disorder, or some other anxiety disorder

Bulimia or anorexia nervosa

Personality disorders especially borderline or antisocial

• Past History of Attempted Suicide

Between 20 and 50 percent of people who kill themselves had previously attempted suicide. Those who have made serious suicide attempts are at a much higher risk for actually taking their lives.

• Genetic Predisposition

Family history of suicide, suicide attempts, depression or other psychiatric illness.

• Neurotransmitters

A clear relationship has been demonstrated between low concentrations of the serotonin metabolite 5-hydroxyindoleacetic acid (5-HIAA) in cerebrospinal fluid and an increased incidence of attempted and completed suicide in psychiatric patients.

• Impulsivity

Impulsive individuals are more apt to act on suicidal impulses.

• Demographics

Sex: Males are three to five times more likely to die by suicide than females.

Age: Elderly Caucasian males have the highest suicide rates.

Suicide Crisis

Psychological autopsy (1)

- Psychological autopsy (PA) is a standard technique applied in the study of completed suicide
- Uses a combination of interviews of those closest to the deceased and an examination of evidence from administrative sources, e.g. hospital and general practice case-notes, social work reports
- From this information an assessment is made of some/all of the following: the suicide victim's mental and physical health, personality, experience of social adversity and stress, social support, socioeconomic status
- The aim is to reach an understanding/explanation of the suicidal act
- PA probably the most direct technique currently available for exploring individual-level risk factors for suicide

Psychological autopsy (1)

- Limitations of technique include: problems in finding/recruiting informants; conflicting accounts from multiple sources; uninformed informants; lack of informants; missing information in administrative data; time lapse between death and collection of information
- PA often applied in case-control design, with controls being either living or deceased, matched on socio-demographic variables
- PA unable to explore contextual risk factors for suicide

China case study: importance of psychiatric disorders in suicide (1)

- Phillips et al 2002 psychological autopsy (PA) case-control study
- 519 Suicides (Ss), 536 deaths from other injuries, 23 geographically representative sites, mainland
- Adapted the structured clinical interview for DSM-IV (SCID) Axis I disorders to generate diagnoses at the time of death
- Added specific culture-sensitive probes for depressive symptoms to increase the instrument's sensitivity to depression
- Instructed clinical interviewers to use alternative methods of probing for symptoms if respondents had difficulty understanding standard probes
- Overall rate of mental disorder 63% (40% with depressive symptoms)
- Depressive symptom score: measure combining number, severity, and persistence of depressive symptoms over the 2 weeks before death.
 - More powerful predictor than dichotomous variable (presence/absence depression) usually used

'Low-planned' suicides in China

- Based on Phillips et al (2002) PA case-control study
- Restricted to Ss aged 18+ years (no controls) (n=505)
- Suicide planning operationalised as the degree of overt signs of planning based on interview questions relating to the circumstances of the suicide that were judged to tap the content of items contained in the planning (objective) factor of the Beck Suicide Intent Scale (SIS) (excluding suicidal communication)
- Three groups (low-planned, intermediate-planned and high-planned) created based on modified SIS score
- Lower-planned suicides more likely among women, younger individuals and those experiencing acute stress
- Ingestion of pesticides stored in the home was a more commonly employed method in low-planned than high-planned suicides

China case study: importance of psychiatric disorders in suicide (2)

- Phillips et al 2007 PA case-control study
- 887 Ss, 721 non-suicide decedents, 23 regions, mainland
- Prevalence of major depressive episode among Ss: 40.2% using extended SCID (but only 26.4% using standard SCID)
- Strong dose-response relationship between suicide risk and n/severity of depressive symptoms
- Considerable amount of unrecognised depression
- Only 10% of Ss used psychiatric medications in month before death
 - Little difference between those with and without depressive symptoms
- Dimensional measure of depressive symptoms more powerful predictor of suicide risk than categorical (present/absent) diagnosis

China case study: importance of psychiatric disorders in suicide (3)

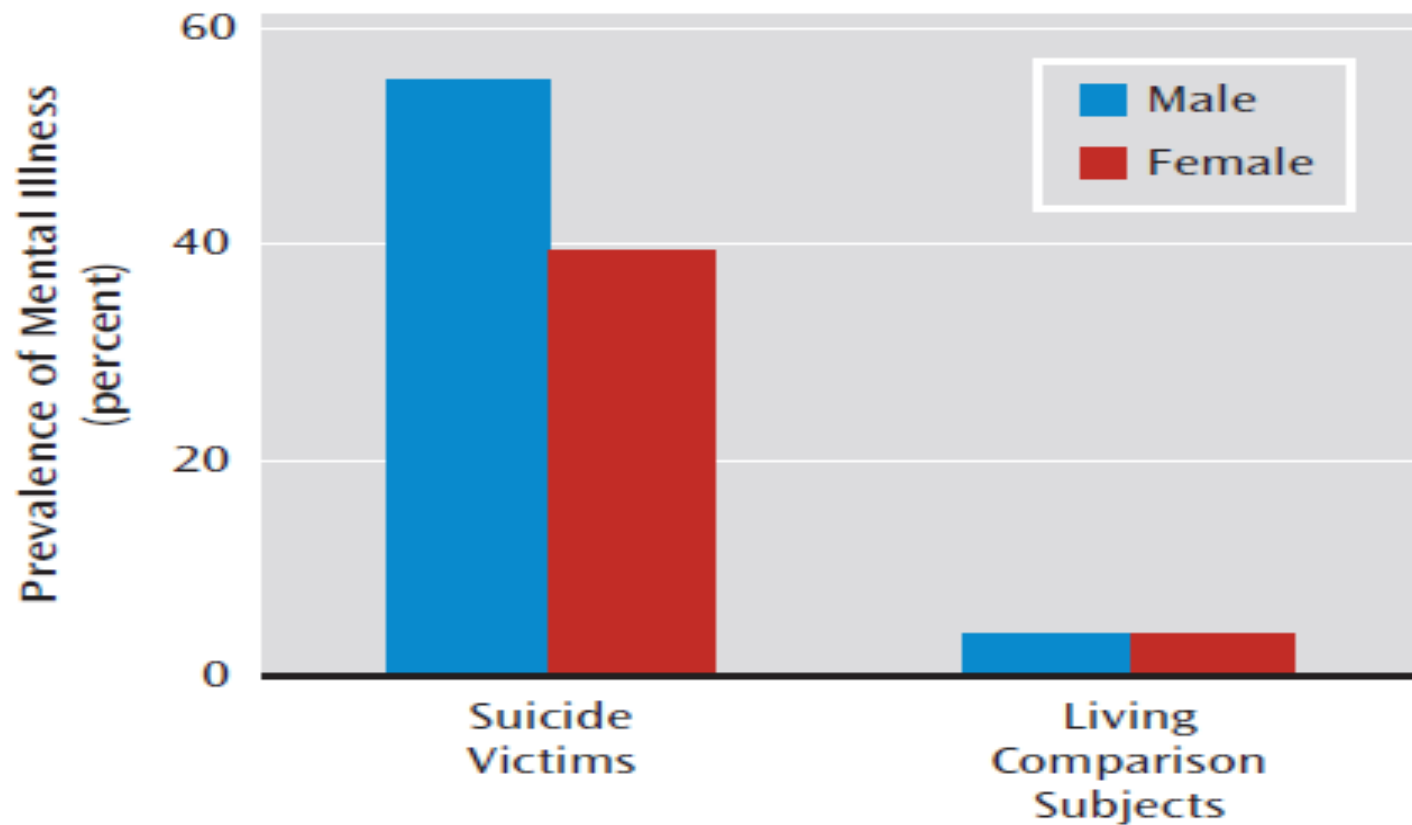
- Li et al 2008 PA case-control study
- 114 Ss aged 15-24 years, 91 deceased by other injuries (same age group)
- 45% met criteria for mental illness at time of death (11% of controls)
 - Prevalence of mental illness in female Ss (38%) was lower than in male Ss (56%)
- Depressive symptoms of varying intensity/duration present in 57% of Ss, but in many cases symptoms not sufficiently severe/persistent to meet criteria for depressive disorder
- Only 10% of all Ss and 22% of Ss with a diagnosable mental illness had ever seen a mental health professional
- Only 8% of all Ss and 18% of Ss with a diagnosable mental illness had taken psychotropic medications in the month before death

China case study: importance of psychiatric disorders in suicide (4)

- Zhang et al 2010 PA case-control study
- 392 Ss, 416 living controls (matched for age and area of residence), 15-34 years, rural areas
- Prevalence of current mental illness: 48% (4% among controls)
 - Majority (72%) of those with mental illness suffering from mood disorder (especially major depressive disorder)
 - Prevalence of mental illness in female Ss (39%) was lower than in male Ss (55%)

Suicide, mental illness and gender

FIGURE 1. Prevalence of Mental Illness Among Male and Female Suicide Victims and Living Comparison Subjects



A typical suicide by a married rural young woman without any diagnosed mental disorders

Ms. Y, a young mother with a small child, lived in her husband's family village, although her husband had a job in the city and was often away. She took care of her child and her parents-in-law, and her daily life was routine. She occasionally complained that she had less time to spend with friends than she did before she was married, although she also understood that a married woman's role was in the home. With her husband away from home, she knew it was her responsibility to show filial piety toward her in-laws. Villagers commented that Ms. Y was a happy and lovely young woman, a model daughter-in-law in the village.

One day, the woman from the compound next door came to her and accused Ms. Y of stealing some eggs from the woman's henhouse. Ms. Y became indignant and hotly

denied the accusation. But the neighbor persisted, claiming that no one else could have stolen the eggs. The quarrel quickly drew a large crowd of villagers. It was becoming increasingly difficult for Ms. Y to maintain her innocence, to "wash herself clean." The fight ended with Ms. Y running to her room and crying. As the crowd was dispersing, Ms. Y grabbed a bottle of pesticide stored behind her front door and gulped down a large amount of the liquid. Her last words were, "I didn't do it. A tree cannot survive without its bark, and person cannot live without face. I will die to prove that I did not steal her eggs." The villagers arranged for a farm tractor to take Ms. Y to the nearest hospital to have her stomach pumped, but she died before it could get there.

India case study: importance of psychiatric disorders in suicide

- Vijayakumar & Rajkumar 1999 PA case control study
- 100 Ss, 100 living controls, matched for age, sex, SES (approx.)
- Prevalence of current mental illness (principal Axis 1 disorder): 88% (34% alcoholism, 17% major depression, 12% adjustment disorder") (cf 14% of controls)

Pakistan case study: importance of psychiatric disorder in suicide

- Khan et al 2008 PA case-control study, Karachi
- 100 Ss, 100 living controls, matched for age, gender and area of residence
- Prevalence of current mental illness (principal ICD-10 diagnosis): 96% (49% severe depressive episode, 30% moderate depressive episode) (cf. 6% of controls)
- Only three Ss receiving (irregular) treatment at time of death
- No S in contact with health professional in month before death
- Majority of Ss died at their first attempt (94% had **not** made a previous attempt) and used lethal methods with a high case fatality rate (especially hanging, [pesticide] poisoning and firearms)

Suicide in China: risk factors (1)

- Phillips et al 2002 case-control study
- 8 significant predictors of suicide in final model:
 - High depressive symptom score, previous suicide attempt (SA), acute stress at time of death, low quality of life (QoL), high chronic stress, severe interpersonal conflict in 2 days before death, previous suicidal behaviour in blood relative, previous suicidal behaviour in friend/associate
- Suicide risk increased with exposure to multiple risk factors (RFs):
 - 2-3 RFs: 30%; 4-5 RFs: 85%; 6+ RFs: 96%
- “Despite substantial differences between characteristics of suicides in China and western countries, and in the socioeconomic environment in which suicides occur, more similarities than differences exist with regard to risk factors for suicide in the two settings..”

Suicide in China: risk factors (2)

- Li et al case-control study 15-24 yr olds
- Significant predictors of suicide: severe life event within 2 days of S; depressive symptoms within 2 wks; low QoL in previous month; acute stress at time of death
- Diagnosis important predictor of suicide in males only
- “[T]here are many similarities but also important differences with those found for Western youth”
 - Use of pesticides
 - Higher incidence among women
 - Acute negative life events and sub-syndromal depressive symptoms (rather than diagnosable mental illness), particularly among women
 - Substance abuse or dependence is uncommon

Suicide in China: risk factors (3)

- “The much lower prevalence and low co-morbidity of mental disorders compared to that reported for youth suicides in Western countries ... suggests that mental disorders play a less central – although still important – role in youth suicide in China.”
- “Despite different characteristics, the pattern of risk factors in youth suicides is quite similar in China and the West.”

Suicide in China: risk factors (4)

- Zhang et al case-control study 15-34 yr olds rural areas
- Significant predictors of suicide: current mental illness, low education, not married, lower level of social support, history of recent and chronic life events
- Additive interaction found between mental illness and lower levels of social support
 - Mental illness may increase an individual's vulnerability through damaging the ability to maintain existing social relationships, develop new relationships or mobilise social support.
- "Although mental illness is a strong risk factor for suicide, it is less prevalent among rural Chinese young people who committed suicide, particularly females, in comparison with other populations in China and in the West."

Suicide in India: risk factors

- Vijayakumar & Rajkumar 1999 PA case control study
- Significant predictors of suicide: axis I psychiatric disorder, family history of psychopathology, life events in month before death
- “These findings indicate that risk factors for suicide are universal across countries and cultures.”

Suicide in Pakistan: risk factors

- Khan et al 2008 PA case-control study, Karachi
- Significant predictors of suicide: psychiatric disorder (especially depression), marital status (**married**), unemployment, negative/stressful life events
- Possible reasons why marriage may be a risk factor include:
 - Early age at marriage
 - Arranged marriage
 - Pressure to have children early in marriage
 - Economic dependence on husband and the joint family system
 - Domestic violence
 - These features result in greater vulnerability to psychiatric morbidity and suicidal behaviour (which is more likely to be fatal because of use of toxic pesticides)

Stereotype of suicide in developing/low-income countries

- Suicide is a 'low-planned'/impulsive act by person who is not mentally ill, has low/no suicidal intent, over-reacts to stressful life events and ingests easily accessible, highly toxic poison (e.g. pesticide)
- This differs markedly (and qualitatively) from the picture of suicide in developed countries
- "The relationship between stress, impulsivity, and suicide is commonly acknowledged by mental health professionals in the developing world. While distress secondary to life events and social circumstances can be relabeled as depression using a medical model, it does not reflect severe mental illness" (Jacob, *Crisis* 2008: 29: 102-6)
- To what extent does the evidence support this picture?

Reality of suicide in developing/ low-income countries (1)

- Prevalence of mental illness in suicide in (many/some) developing countries is almost certainly lower than that found in suicide in developed countries
 - Central estimate based on systematic analysis of PA studies, majority of which have been conducted in W Europe and USA (e.g. Cavanagh 2003), is that 90% have a diagnosable mental illness (typically, depression; but also considerable co-morbidity between mental disorder and substance abuse)
- Nevertheless, mental illness is a potent risk factor for suicide
 - Especially among men

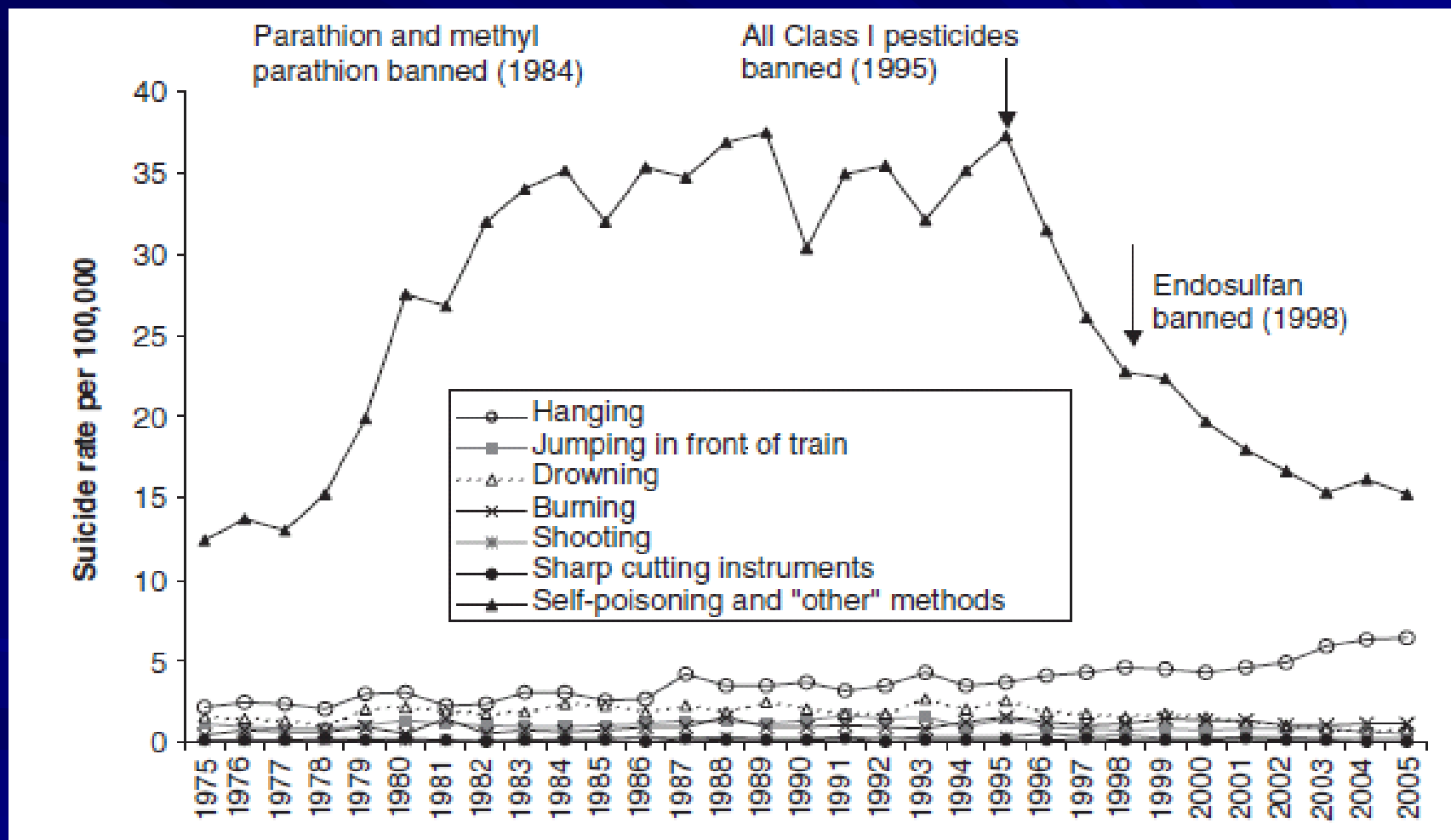
Reality of suicide in developing/ low-income countries (2)

- More universal risk factors (shared by developed and developing countries) are: youth/older age, low socio-economic status, previous suicide attempt, recent stressful life events, ready access to means
- In some developing countries important risk factors include being female, being married, living in a rural area, economic and cultural stressors/conflict, impulsivity/low planning and high case fatality

Tackling the pesticide problem

- Removing highly toxic pesticides from agricultural use likely to lead to large reduction in suicide by poisoning
- Sri Lanka has reduced total suicide rate by >50% by banning a few pesticides, saving thousands of lives
 - Method substitution does not appear to be a major problem, at least in the short term

Method specific suicide rates, Sri Lanka, 1975-2005



Implications for prevention of suicide in developing countries (1)

- Tackle the pesticide problem
 - Regulate the formulation and sale of pesticides
 - Ban sales of more toxic preparations
 - Train primary care personnel in clinical management of pesticide poisoning
 - Educate about safer storage of pesticides (outside the home)
- Strengthen mental health services, especially in rural areas
- Improve early recognition and effective treatment of psychiatric illness/symptoms (especially 'subsyndromal' depressive symptoms)

Implications for prevention of suicide in developing countries (2)

- Improve protection of vulnerable individuals/groups/communities, especially in face of economic and cultural dislocation/change
- Strengthen the position of women in society (improve access to education, literacy skills; tackle domestic abuse/violence)
- Seek to influence cultural tolerance of suicidal behaviour