

From **DEPARTMENT OF PUBLIC HEALTH SCIENCES**  
Karolinska Institutet, Stockholm, Sweden

**MENTAL DISORDERS AND  
ATTEMPTED SUICIDE IN VIETNAM**

Nguyen Van Tuan



**Karolinska  
Institutet**



Stockholm 2010

All previously published papers were reproduced with permission from the publisher.

Published by Karolinska Institutet. Printed by Larserics Digital Print AB

© Nguyen Van Tuan, 2010  
ISBN 978-91-7457-142-4

## ABSTRACT

**Background:** Millions of people die from suicide globally every year. Suicide is strongly associated with mental disorders. More than 90% of those who die by suicide have at least one diagnosable mental disorder at the time of their death. Attempted suicide is also a major public health concern since it is an important predictor of subsequent completed suicide and an indicator of mental health problems.

**Aims:** There are four aims which correspond to four papers. First, we validated the Vietnamese version of SRQ-20 as a tool to detect mental disorders in Vietnam. Second, we analyzed the prevalence and types of mental disorders among people who have attempted suicide. Third, we assessed the incidence, methods used and characteristics of people attempting suicide. Fourth, we followed-up people who had attempted suicide with respect to repeated attempt and completed suicide.

**Methods:** Three studies with different designs were performed. In study I, the Vietnamese version of SRQ-20 was tested and evaluated in 52 people in a district hospital sample and 485 people from the general population. In study II, we investigated patients admitted to a central referral hospital in Hanoi following attempted suicide by poisoning, from July 2007 to February 2008. In study III, we identified all those who attempted suicide during 2003-2007 in a district outside Hanoi. Subjects were retrospectively interviewed by trained medical staff to investigate, socio-demographic and other characteristics, methods used and to estimate incidence. Subjects were followed until the end of June 2009 with respect to repeated suicide attempt and completed suicide. Statistical significance for differences between groups was assessed using chi-square and Fisher's exact tests where appropriate.

**Results:** In paper I, we found that the optimal cut-off points of SRQ-20 in hospital and community settings were 5/6 and 6/7, respectively. In paper II, the most common methods were poisoning by pharmaceutical drugs in urban areas and by pesticides in rural areas. ICD-10 diagnostic criteria confirmed mental disorders were present in 68% of the cases and 73% were rated positive on SRQ-20. Most patients (92%) had not been in contact with psychiatric care. In paper III and IV, we showed that the yearly incidence of attempted suicide was 10.2 per 100000 person-years. 12.5% repeated suicide attempts and 5.8% completed suicide during the follow-up period. 99% of cases attempted suicide by poisoning, 62.6% by pesticides and 36.3% by pharmaceutical drugs. Methods used were mainly drugs (8 cases) and pesticides (5 cases) for repeated suicide attempt, and pesticides, hanging and drowning for completed suicide. 34.3% reported having been in contact with physical health care and 13.2% had received mental health care.

**Conclusions:** We confirmed the validity of the SRQ-20 for use in developing countries, specifically Vietnam, and that it can be used to collect and report data on mental disorder in epidemiological surveys and public health reports. The majority of suicide attempts are undertaken with pesticides and pharmaceutical drugs. The risk of re-attempted and completed suicide is increased among patients who have attempted suicide and most of those who attempt suicide have a psychiatric illness while the large majority has no support from psychiatric care. Thus, suicide prevention strategies should include components for limiting access to pesticides and for the stronger regulation of accessibility of pharmaceutical drugs. Mental health services should focus efforts on safeguard against suicide among high risk groups by developing the care and follow-up of people with mental health problems and those who have previously attempted suicide. Better access to mental health care should be prioritized for this group, possibly by integration of mental health care into primary health care.

# LIST OF PUBLICATIONS

This thesis is based on the following four publications.

- I. Kim Bao Giang, Peter Allebeck, Gunnar Kullgren, **Nguyen Van Tuan**. The Vietnamese version of the self reporting questionnaire 20 (SRQ-20) in detecting mental disorders in Rural Vietnam: A validation study.  
**Int J Soc Psychiatry 2006;52:175-184.**
- II. **Nguyen Van Tuan**, Christina Dalman, Nguyen Viet Thiem, Tran Viet Nghi, Peter Allebeck. Suicide attempts by poisoning in Hanoi, Vietnam: Methods used, mental problems and history of mental health care.  
**Arch Suicide Res 2009;13:1-10.**
- III. **Nguyen Van Tuan**, Christina Dalman, Le Cong Thiem, Nguyen Viet Thiem, Tran Viet Nghi, Peter Allebeck. Suicide attempt in a rural area of Vietnam: Incidence, methods used and access to mental health care.  
**Int J Mental Health Systems 2010;4:3.**
- IV. **Nguyen Van Tuan**, Christina Dalman, Nguyen Viet Thiem, Tran Viet Nghi, Peter Allebeck. Suicide attempt in rural area of Vietnam: follow-up with regard to repeated attempt and completed suicide.  
**Manuscript.**

# CONTENTS

1	BACKGROUND.....	1
1.1	Suicidal behaviours.....	1
1.2	Attitudes towards suicide.....	4
1.3	Mental disorders as risk factors for suicidal behaviours.....	6
1.4	Methods of suicide and suicide attempts .....	9
1.5	Suicide attempt, reattempt and completed suicide.....	10
1.6	Suicidal behaviours in asian countries .....	10
1.7	Strategies for suicide prevention .....	13
1.8	Vietnam .....	16
2	AIMS.....	21
3	METHODS .....	22
3.1	Settings .....	22
3.2	Development of instruments.....	24
3.3	Study designs .....	25
3.4	Data management and data statistics.....	27
3.5	Ethical considerations .....	27
4	RESULTS .....	28
4.1	Development of instruments (paper I) .....	28
4.2	Suicide attempts by poisoning (paper II) .....	29
4.3	Suicide attempt in the general population (paper III).....	32
4.4	Follow-up of suicide attempt (paper IV).....	34
5	DISCUSSION.....	36
5.1	Quality of SRQ-20 .....	36
5.2	Incidence and prevalence of suicidal behaviours.....	37
5.3	Methods used of suicidal behaviours .....	38
5.4	Mental distress and mental disorders .....	39
5.5	Support and use of health care services .....	40
5.6	Methodological considerations.....	41
5.7	Implications for suicide prevention in vietnam .....	43
5.8	Future research.....	44
6	CONCLUSIONS AND RECOMMENDATIONS .....	45
7	ACKNOWLEDGEMENTS .....	46
8	REFERENCES .....	48

## **LIST OF ABBREVIATIONS**

AUC	Area Under the ROC Curve
CHS	Community Health Station
CIDI	The Composite International Diagnostic Interview
GDP	Gross Domestic Product
DSM	The Diagnostic and Statistical Manual of Mental Disorders
DSS	Demographic Surveillance System
FilaBavi	The Epidemiology Field Laboratory of Bavi
GPs	General Practitioners
ICD	The International Classification of Diseases and Related Health Problems
MoH	Ministry of Health
NIMH	National Institute of Mental Health
NPV	Negative Predictive Value
PPV	Positive Predictive Value
ROC	Receiver Operating Characteristics
SAREC	Swedish Agency for Research Co-operation with Developing Countries
SIDA	Swedish International Development Agency
SRQ	Self-Reporting Questionnaires
WHO	World Health Organization

# 1 BACKGROUND

## 1.1 SUICIDAL BEHAVIOURS

Since 1930, when the first “International Classification of Diseases and causes of Death” was adopted, suicide has been included in the section dealing with morbidity and mortality due to external causes (1). Adequate definitions form the backbone of any field of interest, and this is especially true for suicidology. In order to mount effective prevention efforts, suicidal behaviour must be understood, and in order to be understood suicidal behaviour, it must be first defined.

### 1.1.1 Suicidal ideation

The term suicidal ideation or suicidal thought refers to the occurrence of any thought about self-destructive behaviour, whether or not death is intended (2). Such thoughts may range from vague ideas about the possibility of ending one’s life at some point of time in the future to very concrete plans of committing suicide.

### 1.1.2 Attempted suicide

The term attempted suicide is defined in several different ways. It depends on intention, lethality, knowledge of lethality and different traditions such as those between Europe and America. As Bille-Brahe et al. (1994) (1) described, there were at least four ways in which the term has been used in practice:

1. Parasuicide is a subcategory of attempted suicide characterised by low levels of intention to die. This perspective is favoured in America.
2. Attempted suicide is a more specific subcategory of parasuicide characterised by a strong intention to die. This perspective is favoured in Europe.
3. Parasuicide and attempted suicide are mutually exclusive, the former describing cases with low suicidal intent, and the latter used to label cases where the intent to die is clearly evident.
4. Parasuicide and attempted suicide are used interchangeably, recognising the difficulties inherent in ascertaining intent.

In this thesis, the term attempted suicide used for the purpose of these studies is defined according to the WHO/EURO study and reads as follows:

*“An act with a non-fatal outcome in which an individual deliberately initiates a non-habitual behaviour that, without intervention from others, will cause self-harm, or deliberately ingest a substance in excess of the prescribed or generally recognized therapeutic dosage, and which is aimed at realizing changes which the subject desired, via the actual or expected physical consequence” (2).*

Since the 1960's, it has become common to see attempted suicide as a form of communication (3, 4). Attempted suicide is seen as a conscious or subconscious act of communication addressed to others (5). It can be conceived of as an alarm signal, showing distress and appealing for help.

### 1.1.3 Suicide

The word suicide was firstly introduced in the 17<sup>th</sup> century, said to be derived from Latin words *sui* (of oneself) and *caedere* (to kill). Apparently, Sir Thomas Browne - a physician and a philosopher - was the first to coin the term suicide in his *Religio Medici* (1642). The new word reflected a desire to distinguish between the homicide of oneself and the killing another (Minois, 1999) (1).

Based on the different theoretical approaches, there are several definitions of suicide:

1. "All cases of death resulting directly or indirectly from a positive or negative act of the victim himself, which he knows will produce this result" (*Durkheim, 1897/1951*) (6).
2. "All behaviour that seeks and finds the solution to an existential problem by making an attempt on the life of the subject" (*Baechler, 1980*).
3. "Suicide is a conscious act of self-induced annihilation, best understood as a multidimensional malaise in a needful individual who defines an issue for which suicide is perceived as the best solution" (*Shneidman, 1985*) (4, 7).
4. "The definition of suicide has four elements: 1) a suicide has taken place if death occurs; 2) it must be one's own doing; 3) the agency of suicide can be active or passive; 4) it implies intentionally ending one's own life" (*Mayo, 1992*).
5. "Suicide is, by definition, not a disease, but a death that is caused by a self-inflicted intentional action or behaviour" (*Silverman & Maris, 1995*).

However, the definition cannot be based on theory; it must be a description of the concept rather than an explanation (8). In addition, the definition needs to be consistent in relating to different cultures as well as giving a sufficient description. In this thesis, the definition used is the adopted definition of suicide from the WHO is as follows:

*"Suicide is an act with a fatal outcome which the deceased, knowing or expecting a fatal outcome, had initiated and carried out with the purpose of provoking the changes he desired"* (4).

### 1.1.4 Suicidal process

Any suicidal act is preceded by a process that might start with transient suicidal thoughts, then progresses through more concrete plans to subsequent suicide attempts and finally to completed suicide (4). The development of the suicidal process depends upon an

interaction between environmental factors and diathesis. The suicidal process is affected by numerous factors on an individual, interpersonal and societal level. It also depends on culture and physical environments (9). The suicidal process can be interrupted due to treatment but it may also abate spontaneously.

### **1.1.5 Suicidal communication**

Suicidal communication can occur at any point in the suicidal process. The manner in which other people respond to a person's suicidal communication may afford some protection against suicidal behaviour (4). According to Shneidman (1985), the directness of communication in a self-destructive situation may range from no communication to quite direct communication. He notes that it is very unusual for a person to give no indication of his intention to kill him or herself. At times, intense feelings of conflict or desperation may be expressed, and this behaviour indicates a plea for help. At other times, feelings of hopelessness and helplessness may appear (7). Sometimes a suicide note explains the action. At times the content of suicidal communication includes pessimistic reflections on the state of the world and philosophic ideas about the meaning of life in general. Sometimes the communication is very explicit and sometimes it is more subtle (4). There was no significant gender difference in reporting of the separate types of suicidal expressions, except for death wishes, where female reported higher among at least a specific group (10).

### **1.1.6 Types of suicidal communication**

Suicidal communication can be divided into direct and indirect verbal, direct and indirect non-verbal communication (9, 11).

Direct verbal suicidal communication refers to clear and directly expressed suicidal intentions. This form of expression is found among those whose intention it is to take their own lives. Indirect verbal suicidal communication is the expression, in various ways, of the feeling that one's situation is hopeless, that life has no meaning and that there is no solution to current problems.

Direct non-verbal suicidal communication includes various kinds of preparations for suicide. Examples of direct non-verbal suicidal communication may be the collection of drug prescriptions or medicines, buying raticides, writing a farewell letter, etc. Indirect non-verbal suicidal communication comprises withdrawal, deliberate self-isolation, rupturing ties with family and friends, or taking concrete steps to put personal affairs in order.

### **1.1.7 The stress-vulnerability model**

The causes of suicide are complex and no simple explanation of the phenomenon exists. Many people suffer from mental disorder of various types, have personality disorders and

have undergone terrible life events but nonetheless have neither considered taking their own lives nor committed such an act. The propensity to suicide has fascinated many researchers, and various models have been devised to explain the origins of suicidal behaviour. In the stress-vulnerability model, the outcome is affected by risk and protective factors in interaction with diathesis (12).

Individuals at risk for suicide are hypothesized to have various bio-psychosocial vulnerabilities which render them unprepared or ill equipped to handle environmental and social demands or psychological problems. Genetic make-up as well as acquired susceptibility contributes to a person's constitutional predisposition for suicidality. Risk factors determine whether people lose control over their life situation and whether the outcome is a suicide, an attempted suicide or merely suicidal thoughts. Suicidal ideation is situation-dependent, and suicidal acts occur only when risk factors are present and acting in concert and protective factors disappeared (13). Suicide and attempted suicide have been found to experience significantly more negative life events than the general population or other clinical control groups. Family trauma, poor parenting environment, and physical and sexual abuse have all been cited as risk factors for suicide. Interpersonal loss and conflict is a common trigger for suicide among youths. Poor somatic and psychiatric health is other important risk factors (4, 9).

Protective factors that have been found to reduce the risk of suicide are characterized by the ability to communicate with other people, to seek help and advice when difficulties arise in life or with family relationships and a willingness to receive economical or psychological support from family, friends or society. These factors are essential for building sufficiently strong defences against suicidal impulses. Such factors also include treatment of any mental disorder that is present. The physical environment also play a part in mental well-being, and a balanced diet and adequate sleep and light, along with other environmental psycho-social factors, are other key protective factors (9, 14).

## **1.2 ATTITUDES TOWARDS SUICIDE**

Attitudes towards suicide are influenced by different religious and cultural beliefs.

### **1.2.1 Christian religion**

Throughout history the Christian attitude towards suicide has become less restrictive, being more open in Protestantism than in Catholicism. However, for a long time suicide was considered a sin within Christianity for which one is sent to hell. This is most often based on the commandment not to kill. Today, suicide is no longer a crime in European countries, although in some countries death from suicide is still associated with stigma.

### **1.2.2 Confucianism**

The act of suicide itself is not condemned in China as it is in the West. Instead it is viewed in relation to the events that lead to the suicide, and can therefore be seen as something

honourable or dishonourable depending on the circumstances. In China, suicide can be seen as “spirited resistance against something bad and a passionate protection of one’s honour or integrity” (15). In the Chinese cultural tradition, suicide can sometimes be justified if it is for a noble purpose, but in general it is seen as something negative. Confucius would see suicide as an option for protecting one’s virtue and integrity, but that more can be gained by doing well in life instead of killing oneself. This theme follows throughout Chinese culture. However, there are two historical examples of when it is more likely that suicide is expected. One of the cases is when loyal intellectuals to a court are expected to take their life when their ruler loses power so that they cannot be loyal to someone else. Also, women that had been raped were expected to commit suicide. Monuments were even erected for these women. Women who were not chaste were also expected to commit suicide if they were not good wives. The reasoning behind intellectual and female suicide can both be seen as a passionate behaviour to protect one’s integrity and honour. As such these suicides become highly praised because they aim at virtue. Fei argues that other suicides often adhere to the same psychodynamics. Even though the context forces society to condemn the acts as good or bad, suicide is still seen as expressing pride, anger and spiritedness. A person may commit suicide when he or she has done wrong, is shamed or criticized and become too angry to endure these situations. In cases in which suicides are not praised it is usually because the suicide victims have chosen the wrong outlet for their anger or resistance (4).

### **1.2.3 Buddhism**

According to the Buddhist religion, the common belief is that “life” is only a “visiting trip on earth” while “death” would be “returning home”, that “life” is a “temporary dwelling” while “death” would be “a long lasting existence”. This means that the next life depends on how one lives this life and no one can avoid what will happen. Running away from this life by “death” cannot prevent the anxieties of the next life. Such concepts and beliefs are close to the existential model of thinking: seeking the meaning of life while life is almost nothingness. The fact is that the first emperor of the Ly dynasty (by the 10<sup>th</sup> century AC) had been trained and promoted to become emperor by the pagoda; and Buddhism was the national religion for many centuries from 10<sup>th</sup> to 15<sup>th</sup> century AC in Vietnam (for two dynasties: Ly and Tran).

### **1.2.4 Attitudes towards suicide in Vietnam**

Values and orientation depend on personal consideration, tradition and social control. There has been a cultural change in recent generations among Vietnamese people. The elderly people are strongly influenced by Buddhism even though they are not Buddhist, while the young people are not much influenced from Buddhism. In general, suicide is condemned. People who are surrounding suicide persons can express different attitudes to suicide, from sympathy to condemnation and to criticism. In Vietnam, there is no procedure to ascertain suicide as well as there is never a cause of death certification, which

means that statistics on suicide is very poor, and also that the general public is left without knowledge of the magnitude of the problem.

### **1.3 MENTAL DISORDERS AS RISK FACTORS FOR SUICIDAL BEHAVIOURS**

Suicide is strongly associated with mental disorders, more than 90% of all persons who die by suicide having at least one diagnosable psychiatric illness at the time of their death (16, 17). The suicide risk is especially high among untreated patients with depression, especially if co-morbidity and negative life events are present (18, 19). While the knowledge on the association between the following disorders and suicide is well established, the association with suicide attempt is less clear.

#### **1.3.1 Affective disorders**

Affective disorder is the single psychiatric diagnosis most strongly linked with suicide and attempted suicide. Most patients who commit suicide show several symptoms of depression, and up to 60% have fully diagnosable affective disorder (20, 21). The risk of suicide varies between the subtypes of depression (22, 23). Depression is a very common disorder. Its estimated prevalence, the proportion of people who had depression at a given point in time, is 3-5% (24), and the lifetime prevalence is approximately 22-24% for women and 15-16% for men. The central experience is depressed, with marked feelings of emptiness, indifference and hopelessness (25). Symptoms vary in different age groups and between sexes (26, 27). Concentration difficulties, anxiety and alcohol abuse appear to be short-term predictors of suicide and attempted suicide, while mood fluctuations and feelings of hopelessness are long-term predictors (28). The risk of suicide usually first becomes prominent when the patient is in the process of improvement and the psychomotor inhibition decreases while, at the same time, expectations about the capacity to cope with the psychosocial situation are still very negative. General practitioners should be trained to detect masked depression, suicidal thoughts and various types of suicidal communication so as to be able to prevent suicide attempts and suicide (19). Male depression which is not easily recognised and is seldom properly treated or prevented, seems to be related to central serotonin deficiency and hypercortisolaemia (29). In bipolar depression, the lifetime suicide risk among patients with major affective disorder is 15% and among those with bipolar major affective disorder is 20% (30). The majority of patients with a bipolar disorder who commit suicide are, at the time of death, in the episode of a major depressive or in a mixed depressive state (31).

#### **1.3.2 Alcoholism and other psychoactive substance misuse**

The literature has shown a strong association between suicidal behaviours and alcohol consumption. The rate of alcoholism among completed suicide may be as high as 21% and as many as 15-18% of alcoholics may ultimately complete suicide. Alcohol and substance misuse are frequently cited as major risk factors especially in reviews of youth suicide (32, 33). The association between suicidal behaviour and drug misuse has been stated that there is a strong relationship between severity of substance misuse and risk of non-fatal suicidal

behaviour. Suicidal behaviour associated with misuse of substances is reported far more often among men than among women (32, 34).

Longitudinal follow-up studies of alcohol-dependent patients show that approximately 7% die from suicide (35). The suicide mortality rate of drug abusers is estimated to be at the same level as that of alcoholics (36, 37). Retrospective studies have shown that alcohol abuse and dependence characterized 15-50% of people who take their own lives. Alcoholism in connection with suicide among women and the elderly is often under-reported, probably owing to shame (38). People with a tendency towards anxiety and depression are at high risk of suicide when the effect of alcohol wears off, since these symptoms are exacerbated in conjunction with hangover (39).

In substance misuse, when their judgement is blunted and impulses are free from inhibition, the step from thought to act is short. This is why, to a far greater extent than in other people, losses, separations and various types of offence that would be perceived by others to be insignificant may be the factors precipitating suicide in substance misuse (40).

### **1.3.3 Anxiety disorders**

There is evidence that severe anxiety symptoms are a risk factor for suicidal behaviour in hospitalized patients or those admitted to an emergency facility.

A prospective study comparing the presence and severity of symptoms in patients with major depression who committed suicide and those who did not has shown that certain features differed significantly between the suicidal patients and the survivors in the first year of follow up (28, 41, 42): 1) The severity of anxiety; 2) The occurrence of panic attacks; 3) Moderate alcohol abuse; 4) Global insomnia; 5) Severe anhedonia; and 6) Poor concentration. The correlation in this study of suicidal ideation and suicide versus non-suicide reached significance and approached significance for prior suicide attempts only in follow-up years 2-10 (28).

Seventy-nine percent of in-patients who committed suicide were retrospectively reported to manifest evidence of severe psychic anxiety, severe agitation or both in the week before their suicide (43). Ninety percent of patients who were admitted to an emergency facility with suicide attempts that were enough to require admission and who were immediately interviewed reported severe anxiety symptoms before the attempt; 80% reported associated panic symptoms (44).

### **1.3.4 Eating disorders**

Crude mortality rates among people with eating disorders range between 6-8% with suicide as the most common cause of death (45, 46). It is very common for young anorectic girls and boys to be depressed at the same time, and the risk of suicide is some 10 times higher among anorexic girls than among girls in general. Suicide risk remains high for many years

after the initial assessment of eating disorders (47, 48). Very low weight at the time of the first assessment and frequent hospitalization are clear risk factors for suicide. Boys with eating disorders also run a markedly elevated risk of suicide and suicide attempts (49).

### **1.3.5 Adjustment disorders**

A minority (some 10%) of people who commits suicide exhibits no open psychiatric symptoms or psychopathological features at the time of death. Alter et al. (50) showed that suicide may occur among young men “in the absence of apparent psychopathology”. A study (51) found that young men with the diagnosis of adjustment disorder who committed suicide often communicated their suicidal thoughts to others, but that these thoughts were not taken seriously. This also occurs in elderly people who cannot cope with a major change in his or her life situation. If not appropriately managed, a suicide within a short time after such an attempted suicide often occurs (51). Both young and elderly persons who commit suicide and have a diagnosis of adjustment disorder are usually fragile, sensitive, easily hurt and susceptible to stress (52). Longitudinal follow-up studies of patient with adjustment disorder who underwent crisis intervention show that they do not run a higher risk of developing depressive symptoms or dying from suicide than the overall population (53).

### **1.3.6 Schizophrenia and other psychotic states**

Bleuler described the suicidal drive as “the most serious of schizophrenic symptoms”. It is generally considered that up to 10% of schizophrenics die from suicide. Schizophrenic patients who died from suicide had significantly lower negative symptom severity at index admission than patients without suicidal behaviours (54). Two positive symptoms, suspiciousness and delusions, were more severe among those who committed suicide. The paranoid schizophrenic subtype was associated with an elevated risk of suicide (12%). Prominent suspiciousness in the absence of negative symptoms may define a reactively high risk group (55).

Risk factors for suicide in schizophrenia include: 1) Being young and male; 2) Having a relapsing illness; 3) Having been depressed in the past; 4) Being currently depressed; 5) Having been recently admitted to hospital with accompanying depressive symptoms or suicidal ideas; 6) Having recently changed from in-patient to out-patient care; and 7) Being socially isolated in the community (56-59). A study set out to determine which of these risk factors distinguished schizophrenic suicides from living schizophrenic patients. At their last hospitalization, significantly more of the eventual suicides were depressed (80%), felt inadequate (80%), felt hopeless (60%) and had suicidal ideation (73%). They found that being young male and having a chronic illness with numerous exacerbations and remissions (a mean 6.8 admissions during a mean 8.4 years of illness) are the factors that distinguish schizophrenic suicides from living schizophrenic patients (60).

### **1.3.7 Personality disorders**

Psychological autopsy studies show that personality disorders as a principal diagnosis is reported in approximately 9% of people who take their own lives and abnormal personality in up to 30%. However, figures are as high as 34% for principal diagnosis of personality disorder and up to 70% for abnormal personality are also cited (61, 62)

Findings from a study indicated that in most countries the highest rates of attempted suicide were found in girls and young women aged 15-24 years (63). Although the peak rates of males were found in the age group 25-34 years, the rates for boys and young men aged 15-24 years also appeared to be relatively high. Comparison of these findings with those reported in earlier studies showed that rates appeared to have increased since the mid 1980s (64). Personality disorders are common among young people who commit suicide or attempted suicide. The most popular are impulsive type, borderline type or antisocial personality. Several early indicators of these as emotionally unstable, poor emotional control, contact with a child welfare authority or the police, lack of friends and etc were strongly predictive of suicidal behaviours (65-67).

### **1.3.8 Mental disorders as risk factors of suicide and attempted suicide in Asian countries**

A report from the WHO Western Pacific Region, comprising of East Asian countries such as China, Japan, Australia, South Korea, Vietnam, Philippines and some island countries, estimated the number of suicides in the Western Pacific Region were more than 300 000 yearly, comprising 38% of the world suicides in 2002 (17).

There is little knowledge about psychopathology among patients who committed or attempted suicide (68). However, psychiatric disorders are known to be closely associated with attempted suicide in some countries as Japan, South Korea, Singapore and Australia. The most common mental disorder is affective disorder, followed by substance abuse, schizophrenia, etc (17, 69). In addition, attempted suicide is one of the strongest predictors for suicide (69, 70).

## **1.4 METHODS OF SUICIDE AND SUICIDE ATTEMPTS**

Suicide attempt using highly lethal means result in higher rates of death. Where the method is common, restriction of means has led to lower overall suicide rates: firearm in Canada (16), barbiturate restriction in Australia (71), domestic gas detoxification in the United Kingdom (72), etc. Restrictions on access to alcohol have coincided with decreases in overall suicide rates in the former Union of Soviet Socialist Republics (73).

Substitution of method may obscure a change in overall suicide rates, as has been observed for domestic gas detoxification among men in the United Kingdom (74) and in the United States (75) and banning the pesticides parathion in Finland (76). Despite unresolved questions about method substitution, these studies demonstrate the life-saving potential of

restricting lethal means. Gauging the extent to which declining overall suicide rates are directly attributable to restriction in access to particular means requires consideration of long-term trends and confounding factors such as increased antidepressant use.

## **1.5 SUICIDE ATTEMPT, REATTEMPT AND COMPLETED SUICIDE**

Repetition is one of the core characteristics of suicidal behaviour. Among those who commit suicide, up to 44% attempted previously, this being revealed by methods that include psychological autopsy studies. Women more frequently (39%) attempted suicide than men (19%) in the last year before committing suicide (77). On the basis of several studies, it appears that among attempted suicide, “reattempts” are probably commoner than “first-ever”. Between 30% and 60% of attempted suicide had made suicide attempts previous to the index attempt and between 15% and 25% had done so within the last year (78, 79).

Attempted suicide is a predictor of completed suicide as between 10% and 15% may eventually die because of suicide. Mortality by suicide is even higher among persons who have made several attempts (66, 80, 81). The risk of repeated suicidal behaviour is highest during the first year after suicide attempt, especially within the first three to six months (66, 81, 82).

These point to the obvious need to know more in order to prevent repetition. Knowledge of antecedents or risk factors may help early identification of persons at risk and also better treatment. Socio-demographic risk factors associated with repetition are the age group of 25-49 years, being divorced, unemployed, and from lower social class (83). Psychiatric and psychosocial characteristics of suicide attempts are substance abuse, depression, hopelessness, powerlessness, personality disorders, unstable living conditions or living alone, criminal records, previous psychiatric treatment, and history of stressful traumatic life events, including broken homes, and family violence. Prospectively, a history of previous attempts predicts future non-fatal suicide attempts (81, 83, 84).

## **1.6 SUICIDAL BEHAVIOURS IN ASIAN COUNTRIES**

### **1.6.1 Suicide**

According to a WHO report based on suicide reporting from different countries, the highest rate of suicide is found in Eastern Europe while Asia, due to its large population, has highest number of suicides, accounting for up to 60% of all suicides in the world.

The database shows that in Asia, many countries do not report suicide rates. This may be due to legal, religious or social prohibitions against suicide (85). There are differences in suicide rates in Asian and Western countries. Firstly, in Asia the highest suicide rates are often found in the ages below 30 (86, 87) while in Western countries the highest suicide rate is among the elderly. Secondly, the ratio between male and female suicides in Asian countries is often smaller than in Western countries. The ratio in China and India is 1:1.3

and 1.4:1, respectively while the ratio in Western countries is often more than 3:1 (87, 88). Similar to Western countries, suicide rates among males is higher than females in Asian countries, with the exception of China.

*Table 1: The latest rates of suicide in Asian countries (per 100000 inhabitants)*

<b>Country</b>	<b>Year</b>	<b>Males</b>	<b>Females</b>	<b>Total</b>
China (Hong Kong)	2006	19.3	11.5	15.2
China (mainland)	1999	13.0	14.8	13.9
India	1998	12.2	9.1	10.6
Japan	2007	35.8	13.7	24.4
Republic of Korea	2009	N/A	N/A	31.0
Singapore	2006	12.9	7.7	10.3
Sri Lanka	1996	N/A	N/A	21.6
Thailand	2002	12.0	3.8	7.8
Philippines	1993	2.5	1.7	2.1

*Source: [http://en.wikipedia.org/wiki/List\\_of\\_countries\\_by\\_suicide\\_rate](http://en.wikipedia.org/wiki/List_of_countries_by_suicide_rate)*

Worldwide, among adolescents in the 15-19 age groups, suicide was the fourth leading cause of death among young males and the third among young female according to the latest WHO mortality database (89). The suicide rate of young people in the 15-19 age groups (per 100000) in Asian countries is shown in Table 2.

*Table 2: Suicide rates among 15-19 years old persons in Asian countries (per 100 000 inhabitants)*

<b>Country</b>	<b>Year</b>	<b>Males</b>	<b>Females</b>
China (Hong Kong)	1999	5.1	5.3
China (mainland)	1999	3.2	4.8
Japan	2000	8.8	3.8
Republic of Korea	2001	5.9	4.9
Singapore	2001	9.2	7.8
Sri Lanka	1986	43.9	49.3
Thailand	1994	6.1	5.1

*Source: World Health Organization*

Table 2 shows that suicide rates for young people in the 15-19 age group, as for other groups, is higher among males than among females. In Asian countries, the exceptions were found in Sri Lanka and China. Reports from Sri Lanka showed that it is the country with the highest suicide rate among young people. In India and China, suicide is more frequent among married women while separated/divorced women have higher rates of suicide in Western countries. Means of suicide in Western countries are firearms and car exhaust fumes while large numbers of suicide in Asia, especially in rural areas, are committed by using pesticide or insecticide. Self-immolation is common in India while charcoal burning is a common method of suicide in Hong Kong (4).

The magnitude of suicide problems is still hidden in Vietnam since there is no system for monitoring causes of death. According to the Vietnamese Ministry of Health, suicide is estimated among the ten leading causes of death for the entire population of all age groups in Vietnam (90). It is paramount to develop a national mortality register system and regional monitoring system for attempted suicide, so that trends can be followed and data on risk factors monitored at local and regional levels.

### **1.6.2 Attempted suicide**

There are no figures on the exact number of attempted suicides in the world as many countries lack a system for monitoring attempted suicide and it is difficult to define with certainty many forms of self harm as suicide attempt. Studies on attempted suicide are most often conducted on hospitalized patients but some studies are performed in general population surveys or defined epidemiological catchments areas. In general, the prevalence of suicide attempt is considered to be lower in Asian countries than in Western countries, but it is difficult to know to what extent this is due to methodological problems.

The estimated average annual rates of suicide attempt per 100,000 person-years in recent decades range from 2.6 to 1,100 (91). There are differences in suicide attempt rates between countries; for example, the rate is 357-534 per 100000 in Canada, 900-1100 per 100000 in Finland, 49-81 per 100000 in India, and 41-96 per 100000 in Singapore (70, 91, 92).

However, data from most countries is scarce and this is especially the case for South East Asia. The crude annual attempted suicide rate in India has been estimated to 49-81/100000 (86). Tsoi reported that the attempted suicide rate in Singapore in 1974 as 55/100000 and 92/100000 in 1986 (70). In a study using the same methodology, Weissman showed that the lifetime prevalence of suicide attempts was 0.75/100 in Taiwan and 3.2/100 in Korea (93).

Similar to Western countries, attempted suicide is much more common in the 15-34 age group and most common among those who are divorced, widowed or single (86, 94). The ratio of suicide attempts between male and female is 1:2.6 in Hong Kong, 1:1.5 in

Singapore, 1:2.8 in Taiwan, 1:1.2 in Korea (93-96). Studies in Hong Kong, Singapore and China found that the main causes of attempted suicide are interpersonal conflicts (86, 94). While ingestion of pharmaceutical drugs is the most common method of attempted suicide in Western countries, the use of pesticides and sedatives is the most common form of attempted suicide in Asian countries (97).

In Vietnam, a study carried out in an urban community found that life time attempted suicide rate was 0.4% (98).

### **1.6.3 Suicidal ideation**

There are limited studies on suicidal ideation in Asian countries. Weissmann et al. performed a study in nine countries with the same methodology and found that the lifetime rate of suicide ideation in Taiwan was 5.28/100 and in Korea 16.22/100 (93). The results from this study also indicated that the rates of suicidal ideation are slightly higher among females than males in all sites. The exception was Taiwan where the rate of suicidal ideation among females (7.1/100) was two times higher than among males (3.3/100). Divorced, separated or never married persons had the higher rates of suicide ideation in every site (93).

Studies on suicidal ideation in Asian countries are focused on adolescent groups. The rate of suicidal ideation among adolescents is higher than other age groups. The prevalence of suicidal ideation among Chinese people in Hong Kong has been estimated to 6.7% (99) and among Malaysians students age 12 to 19 is 7% (100). The predictors for suicidal ideation among adolescents are depression, smoking, low life satisfaction, conflicts with family members (99-101).

In Vietnam, a study in an urban community found that life time attempted suicide was 8.9% (98).

## **1.7 STRATEGIES FOR SUICIDE PREVENTION**

Suicide is preventable, but different strategies for prevention are needed for different persons and groups. Basically, suicide prevention can be divided into strategies based on health services and strategies targeted to the general population. Although various psychiatric treatments have had the best documented effects on suicide prevention, the emphasis of work needs shift to an earlier stage of the suicidal process and it is advisable that both sets of strategies go hand in hand, for maximum overall impact (102).

### **1.7.1 Health services approach**

Adequate treatment of mental disorders in psychiatric settings and in the general population through the work of general practitioners has hitherto been one of the most thoroughly tried and tested strategies for reducing suicide risk (102).

### *Primary care physicians*

Depression and other psychiatric disorders are under recognized and under treated in the primary care settings (103). Prevention is possible because most suicides have had contact with a primary care physician within a month of death (104). Primary care physician's sometimes lack knowledge or for other reasons fail to screen adequately for depression, leading to under treatment. Therefore, improving physician recognition of depression and to perform suicide risk assessment is an important strategy in suicide prevention. The effects have been related in time to the educational programs. Thus, results from Sweden have indicated that educational programs that can have pronounced effects on physician behaviours and ultimately suicide deaths need to be repeated approximately every 2 year if long-term effects are to be expected (105).

### *Pharmacotherapy*

Mental disorders are present in at least 90% of suicides and more than 80% are untreated at time of death (106). Depression is often under treated in general, even after suicide attempt (107, 108). Thus, treating mood and other mental disorders is a central component of suicide prevention. Serotonin-reuptake inhibitors with proven effects on these symptoms can be used (109).

### *Psychotherapy*

Theories that highlight the presence of multiple motives for attempted suicide perform better in explaining suicidal behaviour than theories emphasising a single motive. As is the case with much other human behaviour, attempted suicide can be triggered by a combination of motives, even when these appear to be conflicting. In all combinations, the wish-to-die and suicide intent can be present in varying degrees. Theories that regard suicidal behaviour as heterogeneous are more relevant since they can explain interpersonal as well as self-directed aspects of self-destructive behaviour. Therefore, the cognitive models, and especially the theory by Beck, appear to be valid and have the greatest descriptive power (110).

Promising results in reducing repetition of suicidal behaviour and improving treatment adherence exist for cognitive therapy (111), problem-solving therapy, intensive care (16), and interpersonal psychotherapy (112), compared with standard aftercare.

### *Follow-up care after suicide attempts*

Many mental disorders, including depression, are chronic and recurrent (113) and compliance with maintenance medication is often poor. Intervention for depression provided by primary care physician are more effective when a case manager follow-up with patients who miss appointments or need prescription renewals (114). Many depressed patients who survive a suicide attempt will make further suicide attempts (115),

particularly in the period shortly following psychiatric hospitalization (116) or during future major depressive episodes (117). Thus, improved acute, continuation and maintenance care, including psychiatric hospitalization, where necessary, of those with recurrent or chronic mental disorders (118), particularly patients who attempt suicide with mood disorders, has potential for prevention.

### **1.7.2 General population approach**

#### *Public education campaigns*

Public education campaigns are aimed at improving recognition of suicide risk and help seeking through improved understanding of the causes and risk factors for suicidal behaviour, particularly mental disorders. Public education also seeks to reduce stigmatization of mental disorders and suicide and challenges the acceptance of suicide as inevitable, as a national character trait, or as an appropriate solution to life problems, including serious medical illness. Despite their popularity as a public health intervention, the effectiveness of public awareness and education campaigns in reducing suicidal behaviour has seldom been systematically evaluated.

#### *Psychosocial support*

Suicide prevention includes a range of interventions focused on community or organizational gatekeepers whose contact with potentially vulnerable populations provides an opportunity to identify at-risk individuals and direct them to appropriate assessment and treatment. Suicide prevention focuses on building up supportive networks and strengthening their life skills that protect people in difficult situations and also on providing close-range support to counter-act the isolation felt by susceptible people. The back-up for vulnerable people who need support from others to cope with stress because they lack a network of family and friends is needed in some cases throughout the whole life. This support works best if it is socially and culturally adapted to the recipients' needs (102).

#### *Environmental measures*

**Means restriction:** Suicide attempts using highly lethal means, such as firearms in US men or pesticides in rural China, India and Sri Lanka, result in higher rates of death (119). Suicides by such methods have decreased after firearms control legislation, restrictions on pesticides, detoxification of domestic gas, restriction on the prescription and sale of barbiturates, changing the packaging of analgesics to blister packets, mandatory use of catalytic converters in motor vehicle, construction of barriers at jumping sites, and the use of new lower toxicity antidepressants (16).

**Media:** Media can help or hinder suicide prevention efforts by being an avenue for public education or by exacerbating suicide risk by glamorizing suicide or promoting it as a solution to life's problems. The latter may encourage vulnerable individuals to attempt

suicide or to be attracted to suicide hot spots portrayed in the media. Media blackouts on reporting suicide have coincided with decreases in suicide rates (120).

### *Networks*

Networks comprising researchers, professional and members are another category of population-oriented inputs. These have to be adapted to local traditions and conditions, are implemented through networks that involve both professionals and lay people on a voluntary basis. After suicide attempt, better structured collaboration between hospitals and teams providing follow-up care may improve compliance with treatment and decrease new attempts, but essential elements of post suicide attempt interventions are yet to be identified (16).

### *Research*

In several countries, databases are being compiled to permit monitoring and identification of trends and patterns of attempted and completed suicide, their socio-demographic and mental characteristics as well as the kinds of treatment provided (102).

## **1.8 VIETNAM**

### **1.8.1 The general health care system**

Vietnam, officially the Socialist Republic of Vietnam, is located on the eastern coast of the Indochina's Peninsula. The land area of the country is about 331,000 square kilometers with the sea coast stretch over three thousand kilometers along the East Coast of the Indochina's Peninsula. Vietnam is made up of equatorial lowlands, high, temperate plateaus and cooler mountainous areas. The population of Vietnam in 2010 is about 85 millions, 51.5% of which are women. Seventy percents of the population live in rural areas (121). There are 54 ethnic groups and the majority is Kinh group (87%). In 2009, the Gross Domestic Product (GDP) per capita was estimated to be 2,957 USD (122).

In 1986, the government initiated a wide-ranging economic reform program, known as *doimoi*. The program put Vietnam firmly on the path of transforming itself from a planned economy to market economy. As a positive impact of the economic reform, the country's economy has been steadily improved, the annual GDP growth rate was 6.8% in 2000, 7.2% in 2003, 7.5% in 2004 and 8.8% in 2007 (123). At the same time, there are many changes in the social contexts, which might affect the health of the population both positively and negatively.

Since the unification of the country in 1975, the health sector in Vietnam has been increasingly strengthened and developed to serve the whole population. Before *doimoi* in 1986, health care services were provided free of charge at all levels of the health system, from central to the grassroots levels.

The *doimoi* reforms contributed to several changes in the health sector. The most important health sector reforms were the introduction of user fees for health services at higher level public health facilities, legalization of private medical practice, liberalization of pharmaceutical industry and deregulation of the retail trade in drugs and medicines (124, 125).

The health care system in Vietnam now is a mixed public-private system, in which the public system plays as a key role in preventive and curative care for the whole population nationwide. The public health care system consists of four levels: central, provincial, district and commune levels. The central and provincial are considered to be the specialized health professional zone, while district and commune levels belong to the basic health care zone.

*Table 3: The Vietnamese public health care system*

<b>Administrative Authorities</b>	<b>Health Authorities</b>	<b>Main Health Facilities</b>
Central Government	Ministry of Health (MoH)	<ul style="list-style-type: none"> <li>– Departments in MoH</li> <li>– National medicine/pharmacy training colleges</li> <li>– Central hospitals</li> <li>– Central research/professional institutions</li> <li>– Central pharmaceutical companies/factories</li> </ul>
Provincial People's Committee	Provincial Health Bureau	<ul style="list-style-type: none"> <li>– Provincial health office</li> <li>– Provincial hospitals</li> <li>– Provincial Preventive Medicines Centre</li> <li>– Provincial pharmaceutical companies/factories</li> </ul>
District People's Committee	District Health Centre	<ul style="list-style-type: none"> <li>– District health centre office</li> <li>– District hospital/polyclinics</li> <li>– District preventive health teams</li> <li>– Public pharmacies</li> </ul>
Commune People's Committee	Community Health Station	<ul style="list-style-type: none"> <li>– Community health Station</li> <li>– Village health workers</li> </ul>

The Ministry of Health is the main national authority in the health sector and has the responsibility to formulate and executive health policies and health programs, to set technical norms and criteria and to monitor preventive and curative activities within the country. There are 17 central hospitals that mainly provide curative care at a higher

technical level, conduct technical supports and supervision to the lower levels and performs professional training and research.

At the provincial level, there are 64 Provincial Health Bureau, each of which serves a population of about 1.4 millions. It is fully under the administration of the Provincial People's Committee, but receives technical guidance and supervision from the Ministry of Health. In each province, there is a general hospital of around 500 in-patient beds, some specialized hospitals, a Preventive Medicine Centre, a Centre for Maternal and Child Health Care and Family Planning and some Provincial Pharmaceutical Companies.

In each district, the public health services consist of a district hospital with around 100 in-patient beds, some inter-communal polyclinics, some public pharmacies and about 15-35 community health stations. The district hospital and the polyclinics are mainly responsible for curative care, while the community health stations are responsible for primary health care that includes essential curative care and preventive care. The district preventive health team and Maternal and Child Health and Family Planning team are responsible for supporting and supervising health care activities at the commune level. Each community health station has three to five health staffs and provides health care for a population of 2,000 - 15,000 inhabitants. Village health workers, who are recruited locally and trained on a number of basic medical topics, are supposed to mobilize and assist with immunization, antenatal care and family planning programs, advise about clean water and sanitation, and offer simple treatments to people in remote villages.

The private sector has steadily developed since 1989. The private medical facilities account for almost half of total number of medical and pharmaceutical facilities. In 1998, there were 19,836 private health facilities in the whole country. They are mainly clinics run by general practitioners or specialized clinics and are only active in curative out-patient care. There are few private hospitals providing in-patient care and they are all located in the big cities. It is important to note that there are a number of un-registered private practitioners, especially in the rural areas (124, 125).

The governmental health budget in 2003 was 7,751 billions VND and accounted for 1.3% of GDP and the corresponding health budget per capita was VND 95,800 (\$6.4) (126). The total health expenditure was about 4% of GDP. Government expenditure accounted for only 30%, the majority being allocated to treatment, which increased from 71% in 1991 to 85% in 2000 (125).

Investigation by the Ministry of Health have shown that self-treatment is common in the community, and the use of public health care services is low, while the use of private health care facilities is increasing (124).

### **1.8.2 Mental health services**

The magnitude of mental health problems in Vietnam has not been well known. According to estimation by the National Institute of Mental Health, the prevalence of mental disorders is around 10-15% of the population. The prevalence of mental disorders is higher in urban areas (127). It has been suggested that the number of people suffering from mental health problems has increased in the past years as an effect of urbanization, economic development and structured changes in society (128).

Mental health services in Vietnam are scant compared to other countries in the region. The specialized mental health services are only available at central and provincial levels of the health care system. Some provinces are still lack of psychiatric care facilities, as well as mental health care professionals. Mental health services are now nearly absent at district and commune levels.

In the whole country, there are two central psychiatric hospitals (one in the North and the other in the South) and one National Institute of Mental Health. In all of 64 provinces, there are 30 psychiatric hospitals and 21 departments of psychiatry that belong to general provincial hospitals, with a total number of 5,000 in-patient beds. There are totally 1,500 mental health professionals having university level or higher and 2,200 psychiatric nurses. Social health workers and clinical psychologists working for mental health have not been employed in the health system. Since 1998, a community-based mental health care program has been implemented nationwide. However, this has just focused on treatment and management of schizophrenic patients (127). As estimated from an epidemiological survey, only one-tenth of people with schizophrenia are receiving adequate treatment or are in contact with health services (128).

In 2009, Vietnam had around 650 psychiatrists per 85,000,000 people (less than one psychiatrist per 100,000 people). The rates for numbers of psychiatrists are indicative of the huge differences in mental health care between Vietnam and the European region. The median rate was 9 psychiatrists per 100 000 population in the 41 countries that provided information (129).

### **1.8.3 Suicide prevention**

There is a shared view that mental health and suicide are major public health concerns in our WHO Western Pacific Region. Available data shows that in 2002, there were approximately 331,000 suicides in the. Suicide is strongly associated with mental illness, with more than 90% of all persons who die by suicide having at least one diagnosable psychiatric illness at the time of their death (17). For this reason, the management of mental health problems and suicide should be essential components of the national health agenda in all countries.

Vietnam is struggling with the organization of its own mental health programme. Suicide prevention services are typically provided through mental health systems, but may also be provided in a variety of other settings: general health services, school systems, non-governmental organizations, professional associations, alcohol and drug abuse programmes, accident prevention initiatives, programmes on domestic violence, survivor groups, spiritual leaders, traditional healers, and others.

## **2 AIMS**

The overall aim of the research was to increase knowledge about occurrence of suicide attempts in Vietnam, and especially the association with mental health problems and access to mental health care. The following specific aims were addressed:

1. To validate the Vietnamese version of Self-Reporting Questionnaire-20 (SRQ-20) in detecting mental health problems in Vietnam (paper I)
2. To analyze prevalence and types of mental disorders, methods used and history of psychiatric care among persons admitted to emergency departments for suicide attempt (paper II)
3. To assess incidence and methods used as well as need of support and use of health care services among persons who committed suicide attempt in rural area in Vietnam (paper III)
4. To follow-up suicide attempters after the index attempt regarding socio-demographic characteristics, repeated attempt and completed suicide (paper IV)

### 3 METHODS

#### 3.1 SETTINGS

##### Study I (paper I)

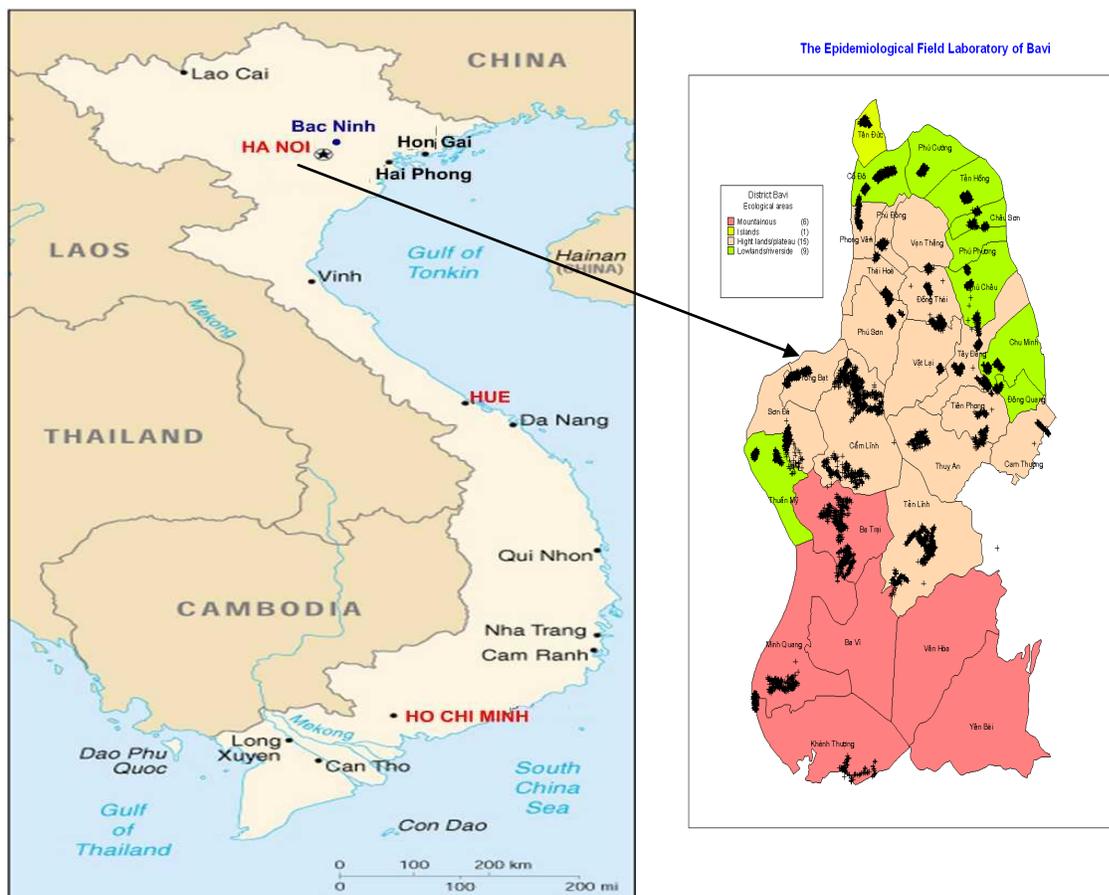


Figure 1: Vietnam, Bavi district and FilaBavi

The study was conducted within the framework of a longitudinal demographic surveillance system (DSS), called the Epidemiological Field Laboratory of Bavi (FilaBavi). The FilaBavi is a multipurpose epidemiological field study. The aim is to provide demographic, health and health care information for health planning and also to serve as a background for specific epidemiological studies (130).

FilaBavi is located in Bavi district. Bavi is a typical rural district in the North of Vietnam. This district has a land area of 410 km<sup>2</sup> with a population of about 240,000 people. Almost 80% of the population is farmers; some are governmental staff, handicraft makers and small traders. Illiteracy among people over 15 years is 0.4%. The district has one general hospital, three polyclinics, 32 communal health stations and some private pharmacies together with some private practitioners.

## Study II (paper II)



*Figure 2: Bach Mai Hospital*

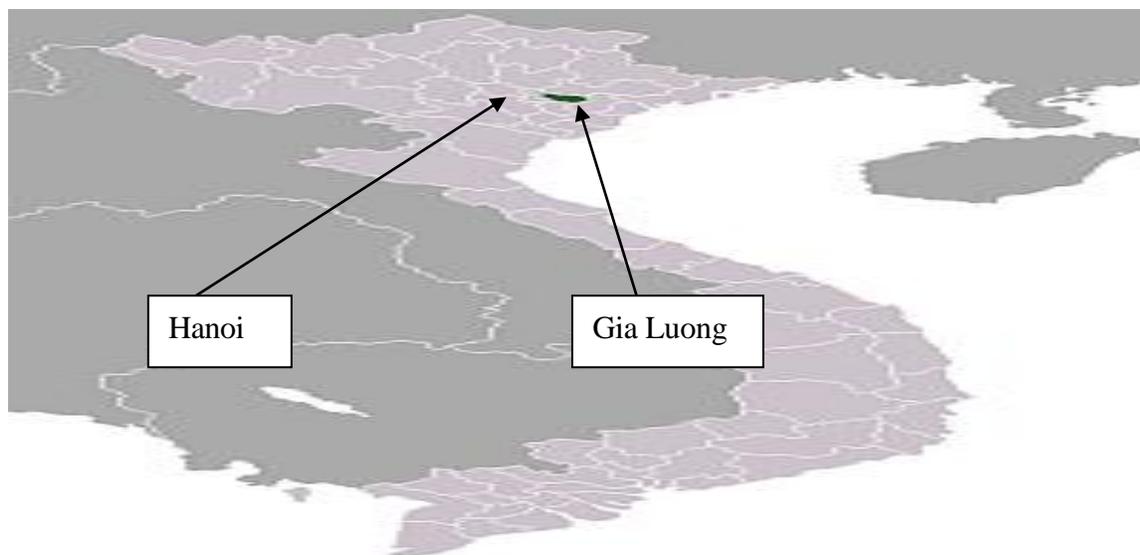
The study was performed on all patients admitted to a National Referral Hospital of Bach Mai in Hanoi (Vietnam) due to attempted suicide by poisoning, from July 2007 to February 2008. This is the largest hospital in Hanoi, with 2,000 beds. The hospital's catchments area includes urban, suburban and rural areas. In addition, a number of cases are referred from adjacent provincial hospitals in the Red River delta. The patients treated in the hospital include both patients presenting directly and those referred, as well as paying and insurance patients. All persons who have signs of intoxication are referred to the hospital's Poison Control Center.

## Study III (paper III and IV)

The studies were conducted in the rural area of Gia Luong in Bac Ninh province, located in the Red River Delta of the Northern part of Vietnam. The area covers a land area of 208.7 km<sup>2</sup>. The population during the study period was 204,000 persons, making the population density very high for a rural area, over 1,200 persons per square kilometer. The majority of residents are farmers. There are also government staff, workers, and small traders. The main economic activity in the area is farming. During the last years, a growing number of persons have left after harvest time to work as temporary workers in the city or in other provinces. The major ethnic group is Kinh, which is the biggest group in Vietnam (131).

The health care system in this area is organized according to the general pattern in rural Vietnam. The public health care services consist of two district hospitals, with approximately 120 beds in each, and 29 community health stations. District hospitals are

mainly responsible in curative care, while community health stations are responsible for primary health care including essential curative care and preventive care. There is a small pharmacy available in each community health station and only a few private pharmacies are located in this area.



*Figure 3: Vietnam and Gia Luong district*

## **3.2 DEVELOPMENT OF INSTRUMENTS**

### **The Vietnamese version of SRQ-20 (paper I)**

The English SRQ-20 was developed by the WHO as an instrument to screen for psychiatric disturbances. It consists of 20 questions, which have to be answered by “yes” or “no” depending on the presence or not of symptoms. Each question may score 0 or 1. It means that one can get a maximum score of 20. The SRQ-20 has been found to be reliable, valid and adaptable to screen for mental disorders in many countries, especially in developing countries (132-134)

The English version of SRQ-20 was translated into Vietnamese, in several steps as described by Harding et al. (133), and Orley & Wing (135). The English version was first translated into Vietnamese by the first author together with another Vietnamese medical doctor. A Vietnamese with a Bachelor's degree in English language then re-translated the instrument back to English, and the original questions were identified adequately. The Vietnamese version was discussed by a group of researchers and clinicians to identify any questions that were potentially difficult to understand in the Vietnamese setting. A few wordings were modified as a result. Pilot testing was performed among patients at the consultation department of the National Institute of Mental Health, staff and patients at the district hospital and some people in the community of the Bavi District. Finally, a few other modifications of wording were made in order to make the instrument valid for a Vietnamese rural setting (133, 135).

Some questions about background information, such as education, occupation, current marital status and employment status during the last 12 months prior to the interview were added to the original SRQ-20.

### **3.3 STUDY DESIGNS**

#### **Study I (paper I)**

##### *Study population*

The study was performed in two populations, a sample of patients in the district hospital and another sample from the general community. In the district hospital, 52 persons aged 18-60 years, who came to the consultation department during the course of two days, were invited to participate in the study. To obtain the community sample, three commune representatives of three main geographical areas (lowland, highland and mountainous) of Bavi district was randomly selected from 32 communes. In these communes 500 people aged from 18 to 60 years were randomly selected from an identification number list of communes. A proportional population size sampling method was applied to involve people from three communes in the study.

##### *Data collection*

Six interviewers who are permanently working for the longitudinal epidemiological surveillance system in the FilaBavi project were selected and trained to perform the assessment using SRQ-20. Although no specific test on inter-rater reliability was performed in this study, data quality in the FilaBavi project is assured by re-interviews of 10% of the sample by the field supervisors and 5% by research students (130). A qualified psychiatrist from the National Institute of Mental Health performed a psychiatric examination on all study subjects (the hospital sample and the community sample). The psychiatric assessments were performed without knowledge of the results of the SRQ assessments. The Composite International Diagnostic Interview (CIDI) was used to establish whether a psychiatric disorder was present or not, according to the International Classification of Diseases version 10 (ICD-10) (136). The CIDI was developed by the World Health Organization in order to assess mental disorders according to the definitions and criteria in the ICD-10. This instrument exists in a Vietnamese version and has been used as a diagnostic instrument at the National Institute of Mental Health in Vietnam.

#### **Study II (paper II)**

##### *Study population*

All persons admitted for attempted suicide into Bach Mai hospital's Poison Control Center were eligible for the study (N = 323). Four persons died during the hospital stay. Ten persons were unconscious or could for practical reasons not be interviewed. The study population thus included 309 persons, aged 10-85 years.

### *Data collection*

All patients admitted to the hospital's Poison Control Center were diagnosed by the physician in charge and all cases of suicide attempt were recorded. Classification of the suicide attempts was performed using the research criteria of the WHO Multicentre Study of Attempted Suicide (63).

We selected nurses working at the Poison Control Center to undergo special training to perform interviews with the patients. A checklist developed within the WHO Multicentre Study was used to record data on gender, age, residence (rural, suburban or urban area), history of suicides and attempted suicides in the family, history of individuals' attempted suicide, psychiatric treatment, and methods used in the attempt. The nurses also applied the SRQ-20 to assess level of mental distress (63).

Qualified psychiatrists from the National Institute of Mental Health performed psychiatric assessments on all study subjects. The psychiatric assessments were performed without knowledge of the results of the SRQ assessments. Psychiatric diagnoses were based on criteria of the tenth version of the International Classification of Diseases (ICD-10) (67).

### **Study III (paper III and IV)**

#### *Study population*

All persons are residing in the Gia Luong area, approximately 204,000 persons during the study period.

#### *Data collection*

We identified persons who had been admitted to the district hospitals, as well as all health care stations, during 2003-2007 in Gia Luong area after having committed either a definite suicide attempt or an uncertain suicide attempt according to ICD-10 criteria. In addition, cases living in the area having stayed at home but were recognized by the medical staff working in the village were included. For persons who had committed more than one suicide attempt during studying period, we used the first attempt as the index attempt. Each case of suicide attempt was diagnosed and re-evaluated by trained physicians according to the research criteria of the WHO Multicentre Study of Attempted Suicide (63).

Data was collected retrospectively in the beginning of 2008 based on records kept at the health services and interviews with medical staff.

In 2009 a follow up was performed of these subjects through 30 June 2009, in order to identify repeated suicide attempts and completed suicides with a follow up time of at least one and a half year.

All persons who had committed suicide attempt were interviewed face-to-face by trained medical staff working at the community health stations. We used the instrument developed by the WHO Multicentre Study of Attempted Suicide (63) to record data on age, gender, marital status, types of living, occupation, date of the event, perceived need of support and use of health care services after the index attempt.

### **3.4 DATA MANAGEMENT AND DATA STATISTICS**

#### **Data management**

The FilaBavi has employed 6 field supervisors to take responsibility in doing re-interview of 5% of all completed interviews. Field supervisors are also in charge of checking all interview forms before submitting for data entering (130).

#### **Data analysis**

In study I, data analyses were done using STATA 7.0 software. Sensitivity, specificity, predicted values and misclassification rate of SRQ-20 in detecting mental disorders were estimated using the psychiatrist's assessment as the validity criterion. Receiver Operating Characteristic (ROC) analysis was applied to identify the optimal threshold score of SRQ. ROC analysis has been considered as the most sophisticated way to present data on criterion validity (125, 137). ROC curves were obtained by plotting sensitivity against the false positive rate for all cut-off points ranging from 0 to 20. Student's test was used for continuous variables.

In study II and III, data analysis was performed using SPSS for Window Version 10.0 (SPSS, Chicago, IL, USA). Statistical significance for differences between different groups was assessed using Chi-square and Fisher's exact tests where appropriate. Cut-off point 5/6 was used to classify presence of mental distress according to SRQ-20. The annual incidence rates were based on a mean population of 204,000 inhabitants. Analyses are based on the index attempt during the studying period.

### **3.5 ETHICAL CONSIDERATIONS**

Suicidal behaviour is a sensitive issue and all persons performing interviews and assessment are experienced health care staffs, specially trained for the specific purposes of the studies (e.g. applying instruments). All interviews will be performed with informed consent from the study subjects.

Ethical permission has been obtained from Umeå University regarding the FilaBavi epidemiological surveillance system and from Gothenburg University, regarding psychiatric assessment of a sub-sample, used in the study I. Ethical permission also has been obtained from Hanoi Medical University regarding all studies of "Mental disorders and attempted suicide in Vietnam" for study II and III.

## 4 RESULTS

### 4.1 DEVELOPMENT OF INSTRUMENTS (PAPER I)

#### *Face validity*

The SRQ-20 had high face validity in our setting. It was found clear and relevant by staff and it was well understood by subjects.

Table 4 shows the results of factors analysis using principal components technique with Varian rotation. Items with factor loadings less than 0.40 were disregarded. Two main factors were extracted with an Eigenvalue greater than 1. The factor I seemed to present “depressive” symptoms and explain 8.8% of the variance.

*Table 4: Factor analysis of the SRQ-20 using principal components technique with varimax rotation*

<b>Factor I: somatic symptoms</b> <b>Eigenvalue: 4.8, variance: 24.6%</b>			<b>Factor II: depressive symptoms</b> <b>Eigenvalue: 1.8, variance: 8.8%</b>		
<i>Question</i>		<i>Loading</i>	<i>Question</i>		<i>Loading</i>
20	Easily tired	0.75	16	Feeling worthless	0.77
18	Feeling tired all the time	0.73	17	Having thought of ending life	0.74
1	Headache	0.64	10	Crying more than usual	0.57
8	Having trouble thinking clearly	0.58	14	Being unable to play useful part in life	0.47
6	Feeling nervous, tense or worried	0.49	11	Difficult to enjoy daily activities	0.45
4	Easily frightened	0.45	9	Feeling unhappy	0.44
2	Poor appetite	0.44			
3	Sleeping badly	0.43			

#### **Criterion validity**

##### *Validity indices*

At all cut-off scores, the validity indices of SRQ-20 in community setting seemed to be higher than those obtained in the hospital setting. Positive predictive values were much lower than negative predictive values at all cut-off points. Misclassification rates varied from 23% to 54% in the hospital setting and from 9% to 60% in the community setting.

### Optimal cut-off point

According to the ROC analyses (Figure 4), the selected optimal cut-off point for case-detection in the community sample was 6/7 with sensitivity of 85%, a specificity of 61%, a PPV of 19% and a NPV of 97%. For the case-detection in the hospital sample, the corresponding cut-off was 5/6 with sensitivity of 85%, a specificity of 46%, a PPV of 34% and a NPV of 90%. At the optimal cut-off point, misclassification rates in hospital and community setting were 44% and 37%, respectively.

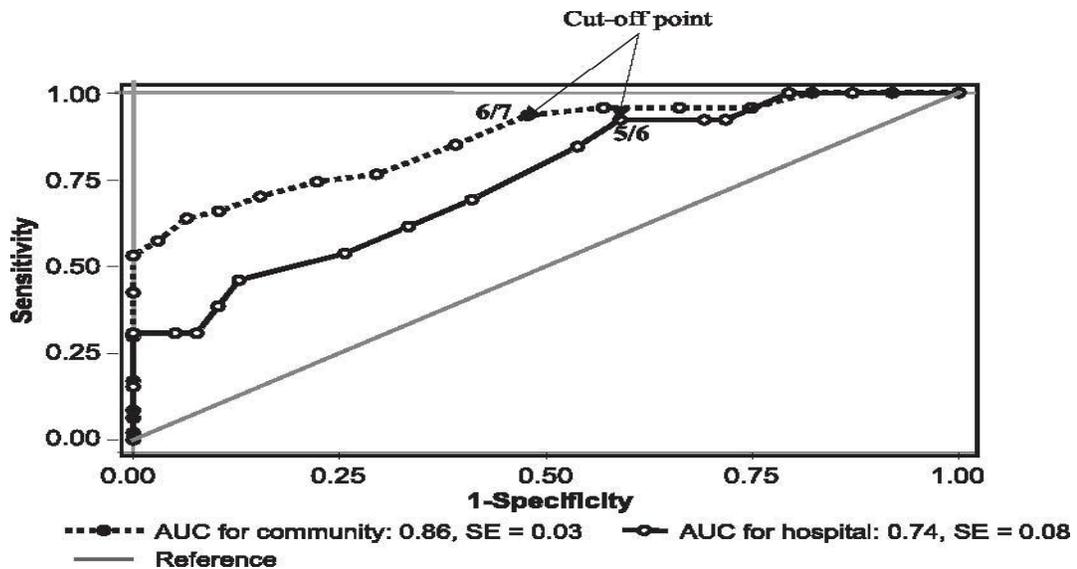


Figure 4: ROC analysis of the Vietnamese SRQ-20 in community sample and in district hospital

### Discriminating ability

The discriminating ability between case and non-case of the SRQ-20 was acceptable in both samples. The AUC in the community sample was 0.86 (95%CI: 0.81-0.93) and in the hospital sample was 0.74 (95%CI: 0.59-0.89).

### Internal consistency reliability of the SRQ-20

The SRQ-20 had an acceptable internal consistency with an overall Cronbach coefficient for all of items was 0.83 ( $\geq 0.81$ ).

## 4.2 SUICIDE ATTEMPTS BY POISONING (PAPER II)

### Methods used of poisoning

Table 5 shows the methods of poisoning used among suicide attempts. The most common methods were poisoning by pharmaceutical drugs in the urban area (72%) and the suburban area (45.8%), whereas poisoning by pesticides was the most common method in

the rural area (45.3%). There was a significantly higher use of pharmaceutical drugs in the urban and suburban compared to the rural area ( $p<0.01$ ), and a significantly higher use of pesticides in the rural area ( $p<0.01$ ).

*Table 5: Methods used of attempted suicide events, by area of residence*

<b>Methods (ICD-10 code)</b>	<b>Urban N (%)</b>	<b>Suburban N (%)</b>	<b>Rural N (%)</b>
<b>X60:</b> non-opioid analgesics, antipyretics and ant rheumatics	15 (8.9)	1 (4.2)	9 (7.7)
<b>X61:</b> antiepileptic, sedative-hypnotic, anti-parkinsonism and psychotropic drugs	121 (72.0)	11 (45.8)	36 (30.8)
<b>X63:</b> other drugs acting on the autonomic nervous system	8 (4.8)	1 (4.2)	12 (10.3)
<b>X64:</b> other unspecified drugs, medicaments and biological substances	3 (1.8)	0 (0.0)	3 (2.6)
<b>X65:</b> alcohol	2 (1.2)	1 (3.2)	2 (1.7)
<b>X66:</b> organic solvents and halogenated hydrocarbons and their vapors	1 (0.6)	0 (0.0)	0 (0.0)
<b>X68:</b> pesticides	11 (6.5)	9 (37.5)	53 (45.3)
<b>X69:</b> chemicals or gases	4 (2.4)	1 (4.2)	0 (0.0)
<b>X71:</b> others	3 (1.8)	0 (0.0)	2 (1.8)
<b>Total</b>	<b>168 (100.0)</b>	<b>24 (100.0)</b>	<b>117 (100.0)</b>

### **Psychiatric diagnosis and treatment**

As shown in Table 6, two hundred and nine cases of suicide attempt (67.6%) met the criteria for a psychiatric diagnosis according to ICD-10. Affective disorders including depressive and bipolar disorders (28.5%) were the most common, followed by adjustment disorders (9.1%), substance-related disorders (7.8%), schizophrenia and other psychotic disorders (4.9%).

Around 92% of all cases who had a psychiatric diagnosis were without psychiatric treatment at the time of suicide attempt. However, all persons with schizophrenic and other psychotic disorders did have psychiatric treatment (antipsychotic medications) at the time of admission. Two persons with many previous suicide attempts (10 and 5 times, respectively) had never been treated in the psychiatric services.

*Table 6: Distribution of study subjects by type of mental disorders, sex and number of patient having received psychiatric treatment for each group of mental disorder*

	Male N (%)		Female N (%)		Total N (%)	
	Mental disorders	Psychiatric treatment	Mental disorders	Psychiatric treatment	Mental disorders	Psychiatric treatment
Depressive disorders	19 (21.8)	3	53 (23.9)	2	72 (23.3)	5
Bipolar disorders	9 (10.3)	0	7 (3.2)	0	16 (5.2)	0
Adjustment disorders	6 (6.9)	0	22 (9.9)	0	28 (9.1)	0
Schizophrenia and other psychotic disorders	5 (6.7)	5	4 (1.8)	4	9 (2.9)	9
Substance-use related disorders	14 (16.1)	0	10 (4.5)	0	24 (7.8)	0
Organic disorders	0 (0.0)	0	5 (2.3)	3	5 (1.6)	3
Anxiety disorders	3 (3.4)	0	12 (5.4)	0	15 (4.9)	0
Dissociate disorders	0 (0.0)	0	11 (5.0)	0	11 (3.6)	0
Somatoform disorders	0 (0.0)	0	6 (2.7)	0	6 (1.9)	0
Dementia	0 (0.0)	0	3 (1.4)	0	3 (1.0)	0
Personality disorders	9 (10.3)	0	1 (0.5)	0	10 (3.2)	0
Mental retardation	1 (1.1)	0	5 (2.3)	0	6 (1.9)	0
Autism	0 (0.0)	0	1 (0.5)	0	1 (0.3)	0
Conduct disorders	0 (0.0)	0	1 (0.5)	0	1 (0.3)	0
Sleeping disorders	0 (0.0)	0	2 (0.9)	0	2 (0.6)	0
<b>Total no of patients with mental disorder</b>	<b>66 (75.9)</b>	<b>8</b>	<b>143 (64.4)</b>	<b>9</b>	<b>209 (67.6)</b>	<b>17</b>
<b>Total no of patients</b>	<b>87 (100.0)</b>	<b>87</b>	<b>222</b>	<b>222</b>	<b>309 (100.0)</b>	<b>309</b>

### **Prevalence of mental distress according to SRQ-20**

*Table 7: SRQ-20 score of study subjects distributed by mental disorder, sex and location*

	Male			Female		
	Mental disorder	Non mental disorder	P	Mental disorder	Non-mental disorder	P
Urban	12.2 ± 3.7	3.3 ± 2.3	.000	11.6 ± 3.4	4.3 ± 2.5	.000
Suburban	14.1 ± 4.2	8	.211	11.8 ± 3.7	2.7 ± 2.9	.002
Rural	12.0 ± 3.1	2.6 ± 1.6	.000	11.9 ± 4.4	4.4 ± 2.6	.000

At a cut off point of 5/6 in SRQ-20, there were 225 cases of mental distress, i.e. 72.8% of all cases, the same proportion in men and women.

Table 7 shows that the SRQ-20 scores among persons with mental disorders were higher than among those without mental disorders in both genders and in the different types of location.

### 4.3 SUICIDE ATTEMPT IN THE GENERAL POPULATION (PAPER III)

#### Incidence and methods used of attempted suicide

There were altogether 104 individuals (54 males and 50 females) who committed a suicide attempt (the index attempt) during the studying period. Including repeated attempts, in total 116 suicide attempts were performed in this population.

The yearly incidence of first attempt was 10.2 per 100,000 person-years, 10.6 per 100,000 in males and 9.8 per 100,000 in females.

Poisoning was used as method in 99% of the cases (Table 8). The most common method of poisoning was by pesticides (62.6%), followed by pharmaceutical drugs (36.3%).

*Table 8: Methods used at the index attempt*

	Index attempt	
	N	%
<b>X60:</b> non-opiate analgesics, antipyretics and ant rheumatics	3	3.0
<b>X61:</b> antiepileptic, sedative-hypnotic, anti-parkinsonism and psychotropic drugs	33	33.3
<b>X68:</b> pesticides	62	62.6
<b>X78:</b> using blunt objects	1	1.0
<b>Total</b>	<b>99</b>	<b>100.0</b>

## Need and support from the family and the community

Moral support was reported needed to a larger extent than practical support from both the family and the community (Table 9). The individuals felt that they received more support, both practical (72%) and moral (85%), from the family compared to the community (21% and 46%, respectively).

Table 9: Needs and supports from family, friends and community

	Family			Friends			Community		
	No, not all	To some extent	Yes, very much	No, not all	To some extent	Yes, very much	No, not all	To some extent	Yes, very much
<b>Practical support</b>									
Do you feel that you need practical support?	36 (36.4)	36 (36.4)	27 (27.3)	60 (60.6)	34 (34.3)	5 (5.1)	58 (58.6)	35 (35.4)	6 (6.1)
Do you feel that you get the practical support you need?	28 (28.3)	44 (44.4)	27 (27.3)	68 (68.7)	29 (29.3)	2 (2.0)	78 (78.8)	18 (18.2)	3 (3.0)
<b>Moral support</b>									
Do you feel that you need moral support from?	17 (17.2)	35 (35.4)	47 (47.5)	34 (34.3)	45 (45.5)	20 (20.2)	41 (41.4)	39 (39.4)	19 (19.2)
Do you feel that you get the moral support you need?	15 (15.2)	42 (42.4)	42 (42.4)	36 (36.4)	54 (54.5)	9 (9.1)	54 (54.5)	39 (39.4)	6 (6.1)

## Use of health care services

A large proportion of the suicide attempters (44.4%) refused to be referred to professional care after the index attempts (Table 10). Only 35 persons (35.4%) accepted referral to professional care to get help for their problems. Altogether 35 persons received care from the official health care services such as hospitals, community health stations and private health care providers. A minority sought care from traditional healers (4 persons) or pharmacies/self-treatment (8 persons). The majority (34.3%) reported having been in contact with somatic care and 13.2% had received mental health care.

Table 10: Uses of health care services after the index attempt, by sex

		Male N	Female N	Total N (%)
Referral to professional care	Acceptance	19	16	35 (35.4)
	No referral to professional care and/or not sure of acceptance for referral to professional care	12	10	22 (22.2)
	Refusals	21	21	44 (44.4)
	<b>Total</b>	<b>52</b>	<b>47</b>	<b>99 (100.0)</b>
Types of health care	Hospitals/community health station/private health care providers	20	15	35 (35.4)
	Traditional healers	2	2	4 (4.0)
	Pharmacy keepers/self-treatments	4	4	8 (8.1)
	<b>No health care</b>	<b>26</b>	<b>26</b>	<b>52 (52.5)</b>
	<b>Total</b>	<b>52</b>	<b>47</b>	<b>99 (100.0)</b>
Types of treatment	In-patient somatic treatment	9	3	12 (12.1)
	Out-patient somatic treatment	8	14	22 (22.2)
	In-patient psychiatric treatment	5	1	6 (6.1)
	Out-patient psychiatric treatment	4	3	7 (7.1)
	<b>No treatment</b>	<b>26</b>	<b>26</b>	<b>52 (52.5)</b>
	<b>Total</b>	<b>52</b>	<b>47</b>	<b>99 (100.0)</b>

## 4.4 FOLLOW-UP OF SUICIDE ATTEMPT (PAPER IV)

### Methods used in repeated attempt and completed suicide

Methods used for repeated suicide attempt were mainly use of pharmaceutical drugs (8 cases) and pesticides (5 cases) (Table 11). Thus, the proportion of attempt by drug poisoning was significantly higher ( $p= 0.032$ ) than at index attempt. Although numbers are small, it is noteworthy that pesticides, hanging and drowning were the main methods used in completed suicide.

Table 11: Methods used in repeated attempt and completed suicide in relation to methods used at index attempt

Index attempt (n = 104)		Repeated attempt (n = 13)		Completed suicide (n = 6)		
		X61: antiepileptic	X68: pesticides	X68: pesticides	X70: hanging	X71: drowning
X60: non-opiate analgesics, antipyretics and anti-rheumatics	3					
X61: antiepileptic, sedative-hypnotic, anti-parkinsonism and psychotropic drugs	34	8				
X68: pesticides	66		5	2		
X70: hanging	0				3	
X71: drowning	0					1
X78: blunt object	1					

#### Time elapsed between index attempt and repeated attempt and completed suicide

The majority of cases of reattempted as well as completed suicide were committed in the first year after index attempt (Table 12). Only one case of repeated attempt occurred more than 3 years after index attempt.

Table 12: Time elapsed between index attempt and repeated attempt and completed suicide

	Repeated attempt		Completed suicide	
	n = 13		n = 6	
< 1 years	8		4	
1-2 years	4		2	
3-6.5 years	1		0	

## 5 DISCUSSION

The aim of this thesis was to contribute better understanding of epidemiology and characteristics of suicide attempt in Vietnam. In study I, we validated a feasible, adaptable, valid and cost-effective instrument to assess mental disorders in Vietnam as well as in other developing countries. In study II, we analyzed prevalence and types of mental disorders, methods used and history of mental health care among hospitalized suicide attempt. In study III, we investigated incidence and methods used of attempted suicide, and followed up suicide attempters after the index attempt regarding socio-demographic characteristics, need of support, use of health care services, repeated attempt and completed suicide. The results reported in four papers give evidence and background information for suicide prevention strategies in Vietnam, and especially to improve mental health services.

### 5.1 QUALITY OF SRQ-20

#### Validity

In study I, aiming at a sensitivity of at least 80% and based on the AUC values, we found that the optimal cut-off point for the community sample was 6/7. A range of cut-off points from 3/4 to 11/12 have been used in other studies over the last three decades (138-140). However, the optimal cut-off point generally reported has been 7/8, as in the studies reported from Kenya, Senegal, Brazil, Guinea, and Zimbabwe (141, 142). In accordance with the study from Ethiopia, we found higher levels of sensitivity and specificity in the community setting compared to hospital setting at each cut-off point (143). At the optimal cut-off point identified had 85% sensitivity and 61% specificity. These indices are acceptable as they are in the normal range of other studies. However, some studies found a higher sensitivity and specificity at the optimal cut-off point (142).

The ROC analyses revealed that the Vietnamese version of SRQ had a high ability to discriminate between cases and non-cases. The value of AUC in our study meant that there was 86% likelihood that a randomly selected person with mental disorder would receive a higher score on the SRQ than a randomly selected person without mental disorder. This is comparable to findings in other studies (144, 145).

#### Reliability

The internal consistency indicated the intercorrelation between items in a questionnaire. In study I, we did not examine the reliability of SRQ-20. However, we have added analysis of internal consistency of SRQ-20 in this thesis showing that the SRQ-20 had a good internal consistency with a Cronbach coefficient alpha of 0.83 (CI $\geq$ 0.81). Iacoponi and Mari (1989) in Portuguese found a satisfactory coefficient of 0.81, while other researchers rarely reported this index (146).

Another indicator often used to examine the reliability of an instrument is the agreement between instruments that measure the same condition. Several studies reported a strong correlation between the SRQ-20 and other equivalent measures, such

as the General Health Questionnaire, indicating high reliability of SRQ-20 (125, 132, 144, 145).

## **5.2 INCIDENCE AND PREVALENCE OF SUICIDAL BEHAVIOURS**

### **Incidence of suicide attempt**

The incidence rate of suicide attempt was 10.2 per 100,000 person-years in our study. Our incidence is lower compared to countries such as Canada (357-534 per 100,000), Norway (90-149 per 100,000), and Singapore (41-96 per 100,000), but higher compared to Nigeria (2.6 per 100,000) (70, 91). Lack of previous community-based research precludes us from concluding whether the incidence rates of suicide attempt in rural Vietnam have increased or decreased in response to the country's rapid socioeconomic change.

On the other hand, suicide attempt is still stigmatized in Vietnam. Thus, there might be cases that were not in contact with health services and not reported. Previous studies from Hanoi (98), China (147) and some other low and middle income (148) measured lifetime suicide attempt using an interview survey, not enabling incidence assessment. The Nigeria study was based on representative population sample giving low incidence. The fact that we did attempt to get data from all relevant health facilities increases likelihood of good coverage.

There was no major gender difference in rates of suicide attempt in our study (male/female ratio is 1.1:1). Studies from Nigeria and Finland showed higher ratios, 1.4:1 and 1.3:1, respectively (149). Lower ratios (more suicide attempts among females) have been reported from England (1:1.2), France (1:1.9), and Singapore (1:2.3) (63, 91).

### **Re-attempted suicide**

In our study, 12.5% of the patients (or 31 per 100,000 person-years) reattempted suicide during the follow-up period. This is three times higher than the rate of suicide attempt in the general population (10.2 per 100000 person-years) in the same area (153). The rate of repeated attempts in our study is lower comparing to the results from other studies, 49-81/100 000 in India and 55-92/100 000 in Singapore (68, 154).

Repetition of suicide attempt is common during the first year after the suicide attempt (155-157). This should be known to general health services, since mental health services are not developed in the countryside in Vietnam, as is the case for many countries in the area (17). Although we identified most reattempts during the first year, we can not exclude that more attempts would have occurred with a longer follow-up time.

The rate of repeated suicide attempt in our study within a year was 8 %, which is in the lower range of what has been reported in the literature (9-32%) (154, 158).

## **Completed suicide**

Six percent of our subjects completed suicide during the follow-up. This is higher than the figure given by Hawton and Fagg (1988) (1% of suicide attempters) but lower than the 10% reported by Isometsa and Lonnqvist (77).

We thus confirmed that also in this Vietnamese population, the risk of completed suicide after a suicide attempt is considerable, as has been noted in many Western studies (16, 159).

### **5.3 METHODS USED OF SUICIDAL BEHAVIOURS**

#### **Methods used of suicide attempt**

Pesticides and other chemicals used in agriculture was the most common way of intoxication among persons from rural areas. This is in agreement with what has been reported from other developing countries, such as China, Malaysia, and Uganda (88, 97, 119). This is almost unheard of in both attempted suicide and suicide in the West (88). The existence of potent pesticides in most farmers' homes without security arrangements makes pesticides easily accessible. Pesticides are also cheaper compared to medications and other chemicals used for intoxication (68). The WHO reports that pesticides are now the most common method of suicide worldwide (150). The most likely explanation for the high numbers of pesticide suicides in developing countries is the high case fatality associated with pesticides ingestion compared to the relatively low case fatality of many of the substances commonly taken in acts of self-poisoning in the West. The case fatality was lower than in series reported as Sri Lanka, may be due to the fact that the proportion of suicide attempt by pharmaceutical drugs was higher (119). The urbanization seems to be associated with the transition of the methods of poisoning used from pesticides to pharmaceutical drugs, which has recently been reported from Sri Lanka (151, 152). Thus, suicide prevention strategies should include components for limiting access to pesticides as well as pharmaceutical drugs.

Attempted suicide in urban areas by means of psychotropic drugs such as antiepileptic (barbiturate), sedative-hypnotic (benzodiazepine) and rotunda (a traditional medicine with an sedative-hypnotic effect) and antipyretics, is more in line with the pattern observed in Western countries (63). In many Western countries, over-the-counter sale of antipyretics has been restricted to small quantities or sale of analgesics confined to prescription only, in order to reduce accessibility to these dangerous means of attempting or committing suicide. In Vietnam, antipyretics is still sold over-the-counter in large quantities whereas tranquilizers are restricted to avoid the risk of addiction (68).

In the suburban area both intoxications with pesticides and other chemicals used in agriculture and by means of pharmaceutical drugs were common. This area has recently been industrialized. Residents are both farmers and other occupations in more or less equal proportions. It seems that the urbanization is associated with the transition of the methods of poisoning used from pesticides to pharmaceutical drugs, as has recently been reported from Sri Lanka (151).

### **Methods used in re-attempted suicide**

The study of reattempted suicide was carried out in a rural area of Vietnam. The use of pesticides was a less common method in repeated attempt compared to the index attempt. This may reflect a tendency to more suicide attempts being committed by drugs compared to pesticides as previously shown (153). This should be known by general health services as these often are the main points of contact as mentioned above.

### **Methods used in completed suicide**

In rural area, methods used among completed suicide were pesticides, hanging and drowning. Notably the numbers were limited. However, it is interesting to note that we found no case of completed suicide by drugs, although several of those who repeated suicide attempt used drugs. It is possible that persons who do have an intention to die from the act use more lethal methods, and in that case it is “better” that drugs are used in case of suicide attempt rather than pesticides. We thus confirmed ours and many others previous findings of pesticides as a still common and serious method of suicide in low income countries (152).

## **5.4 MENTAL DISTRESS AND MENTAL DISORDERS**

### **Mental distress**

We identified 225 cases of mental distress when assessing by the SRQ-20, accounting for 73% of all subjects. SRQ-20 score among persons with mental disorders was significantly higher than among those without mental disorders in both genders and areas of residence. According to the World Health Organization (WHO), mental health problems amount to nearly one-third of disability in the world (160). It is important to set up better systems for monitoring mental health in community.

### **Mental disorders**

We found that 67.6% of the poisoning cases had a psychiatric diagnosis. Mood disorders (28.5%) were the most common diagnostic group, followed by adjustment disorders (9.1%), schizophrenia and other psychotic disorders (2.9%). This is consistent with other reports showing a high prevalence of patients who met the DSM-IV criteria and/or the ICD-10 criteria for a psychiatric diagnosis among suicide attempters (161). It is well known that the vast majority of attempted suicides comprise psychiatric morbidity.

The prevalence of mental illness in self-harm patients admitted to a general hospital in Wales during the period 1996-2000 was 63,7% (162). In Japan, Yamada et al (2007) showed that 95% of suicide attempters met the criteria for psychiatric diagnosis. Mood disorders (24%) were the most common, followed by adjustment disorders (18%), schizophrenic disorders (17%), and substance-abuse related disorders (11%) (69). Kumar et al (2006) in India found that 81% of patients in the high intent group had a mental disorder, with depressive disorder being the commonest (163). 98% of a general

hospital sample of suicide attempters had a mental disorder with 67% having a depressive disorder (164).

Alcohol misuses, which are commonly found in Western studies among both males and females who attempt or commit suicide (73) were less common in our population (1.3%). Opiate dependence was more common (6.5%). Using opiate without prescription is illegal and stigmatized in Vietnam. Opiate dependants often cope with the difficulties of economics, family conflicts, social stigmatization, and justice and are considered as criminals. These circumstances may lead the opiate dependants to cease their life (165).

## **5.5 SUPPORT AND USE OF HEALTH CARE SERVICES**

### **Need of support from the family and community**

Need of support from the family was reported to be higher than need of support from the community. This is contrary to findings from high income countries, in which the need of support from the community has been showed to be more important than from the family (166). This could be explained by the differences in supply of services between low, middle income and rich countries. Moral support was more needed than practical support, from the family as well as the community. This suggests that the problems perceived by persons who have attempted suicide are less medical or psychiatric, but more of psychosocial nature(167).

### **Uses of health care services**

The study showed that only 13.2% of suicide attempt had contact with the psychiatric care after the index attempt. Physicians and medical staff at community health stations and district hospitals should be more aware of suicidal behaviour as well as mental health problems in the community. Policy and training should aim to reduce stigma associated with mental illness and general psychological distress.

Ambivalence to treatment and early dropout were well-known problems among suicide attempt (168, 169). However, the proportion who accepted referral to professional care in this study (35%) was even lower than in other studies (170). Unfortunately, we did not ask specifically about reasons for this. One reason could be that suicidal behaviours in Vietnam does not consider their problems as mental health or medical problems and doubt the appropriateness of contact with mental health services (171). Another hypothesis is that the stigma connected to suicide attempt in Vietnam is higher compared to western countries. Integrating mental health care into primary health care could be one way to improve the care of people who have attempted suicide or who have other mental health problems (147).

### **Contact with mental health services**

In our study, 8% of those with a psychiatric diagnosis had contact with psychiatric care at the time of admission. This is low compared to data from developed countries. In a study from Wales, 24% of the cases were known to have been in contact with mental

health services in the year before death (162). A study from Japan (2007) showed that 70% of persons who were admitted into emergency departments due to attempted suicide had psychiatric treatment (69).

According to the findings, persons with schizophrenia and other psychotic disorders seemed to be well recognized and thus considered to be in need of psychiatric care. All cases with these diagnoses were under psychiatric treatment at the time of the suicide attempt. In contrast, most patients with other diagnoses did not have any contact with mental health services. An explanation to this may be that the Vietnamese people in general consider mental disorders as being equal to psychotic disorders - the “mad”. Thus, they have only brought these persons to mental health facilities. This is a determinant of psychiatric hospitalization after attempted suicide (164). Suicide attempts are simply considered as a reaction to life distress in the view of the Vietnamese people. This can explain why two persons with more than five previous attempts in our study had not been referred to psychiatric assessment.

## **5.6 METHODOLOGICAL CONSIDERATIONS**

A number of epidemiological concepts could be mentioned and discussed in this section. However, I will restrict the text to a few key considerations which are the most important ones for this thesis.

### **Strengths**

The main strength of the research presented in the thesis is that it is the first comprehensive evaluation of suicide attempts in Vietnam, especially with regard to the association with mental health problems and contact with mental health care. Vietnam is a country with a rapid economic development and social transition. Since, this is the case for many South East Asian countries, monitoring and analyzing suicide and attempted suicide is of great interest for other countries in the region and the world.

Study I was a community based cross-sectional study that was conducted within the framework of a Demographic Surveillance System (DSS). The DSS provided good sampling frames, data processing and management for this study. These are crucial to ensure the validity of the community based study. The DSS is a valuable tool for assessing and monitoring the health situation of the population, especially in the countries where health information systems are still defective.

Study II was the first comprehensive evaluation of consecutive patients admitted to hospital because of poisoning due to a suicide attempt in Vietnam. We focused on analyzing the presence and types of mental health distress and mental disorders among suicide attempters during hospital stay. Psychiatric assessment by qualified psychiatrists is one of our advantages.

Study III was also a community based study. It provides increased knowledge about the incidence, methods used, use of health care services, repeated suicide and completed suicide of suicide attempters after the index attempt in rural Vietnam. This is the first follow-up study among persons who have suicide attempt in Vietnam.

## Limitations

Our studies have some limitations, which should be kept in mind. We have identified the following main limitations:

In choosing an optimal cut-off point (study I), changing the cut-off point alters the proportion of well and sick people correctly classified by the test such that an increase in sensitivity is generally associated with a decrease in specificity (172). The choice of the optimal cut-off point depends on what one wants to achieve with the screening. High sensitivity (lower cut-off) should be prioritized if it is important to detect all cases, but high specificity (higher cut-off) should be prioritized if it is important that all detected cases are “true” cases. The performance of instruments is culturally dependent, the validity as well as appropriate cut-off points of instrument can thus differ between areas. Even, in a single setting, the optimal cut-off points for different socio-demographic groups in community and in primary health care can vary (138, 141).

In study II, all cases of suicide attempt consecutively admitted to hospital care at Bach Mai hospital’s Poison Control Center were included. Since, we only include cases admitted to hospital. We have far from covered all cases of suicide attempts in the area. Furthermore, in this study we focused on poisoning cases. However, data from hospital records indicates that more than 80% of suicide attempts are performed by poisoning. Thus, we have presumably identified the majority of cases among those admitted to the hospital.

Study III was based on retrospectively collected data. This is problematic, but to conduct a prospective study would have taken a long time, and the staff trained for this study was not available for a longer time. Socio-demographic characteristics, need of support and use of health care services were assessed by retrospective self-report without independent validation. Although systematic reviews have shown that adults can recall past experiences with sufficient accuracy (147), recall bias arising for various reasons can not be excluded.

The study was performed in a rural area, and with increasing urbanization, findings might be less valid for the general population (152). Consequently, our findings may at best be generalized to the rural population. Furthermore, suicide attempt is still stigmatized in Vietnam. Thus, there might be cases that were not in contact with health services and not reported. Studies from low and middle income countries were often based on hospital records, retrospective interview surveys or representative population sample (86, 91, 93), and findings can be questioned.

We had limited number of suicide attempts for the follow-up study regarding re-attempted and completed suicide. The study thus had a low power to identify risk factors for reattempted and completed suicide. However, we could show that the method is feasible and considers it as a pilot study for future research.

## **5.7 IMPLICATIONS FOR SUICIDE PREVENTION IN VIETNAM**

### **Present situation**

Strategies for suicide prevention have yet not been discussed or planned in Vietnam. National strategy for mental health was developed and initiated in 1999, but these focused on schizophrenia alone. There are various reasons for this. First, Vietnam has not yet had a system for monitoring causes of death, and the magnitude of suicide as an important cause of death is therefore still unknown. From hospital records, the rate of recorded suicides is low. But only a minority of attempted suicide cases is treated in hospital and only a tiny proportion die from suicide in hospital. Lack of involvement by public health professionals and health policy makers is partly due to their ignorance of the scale of suicidal behaviour and seriousness of suicide problems. In addition, cultural factors, such as stigma connected to mental problems and suicidal behaviour, may explain why the problem has been neglected. Limited knowledge of risk and protective factors for suicidal behaviour is another obstacle to the development of suicide prevention strategies.

### **Further suicide prevention**

Although the magnitude of the suicide situation in the World and our WHO Western Pacific Region is acknowledged, little is known about the situation in Vietnam and many developing countries. Hence, utilizing and managing existing data, organizing new data sources for surveillance, and eventually institutionalizing a mortality registration system, are essential. The implementation of a valid and reliable monitoring system is necessary to determine the relative importance of various mental health problems. This is essential to health planning and a critical first step to the allocation of the usually limited resources available.

There is a need for valid and reliable data to support initiatives for suicide prevention programmes. It is recommended that Vietnam needs set up a morbidity and mortality data surveillance system for suicide, develop human resources (for example, epidemiologists and statisticians) needed to maintain a valid and reliable data collection system on morbidity and mortality including suicide. This can be used for research on the causes, risk and protective factors for suicide.

Mental health and suicide are of concern for Vietnam. Hence, we should integrate suicide prevention strategies in our health policy and programmes; identify existing systems and programmes through which data on suicide behaviours can be initially generated (for example, hospital admissions, emergency room contacts, police reports); identify existing systems, programmes, projects or activities in which suicide prevention advocacy could be initially integrated (for example general mental health promotion activities, school programmes, workplace safety, primary health care, drug and alcohol abuse programmes, help-lines, and others). It is important to engage and create partnerships with media to promote suicide prevention efforts in order to improve the quality of the press reports. A most important step would be to develop and enhance access to and quality of mental health services, like improving early detection and treatment of depression and other mental disorders; develop and enhance access to

and quality of other health services, like equipping emergency rooms with poison antidotes and improving treatment of persons with poisoning symptoms.

Acknowledging the differences in the capabilities of the various countries to carry out suicide prevention initiatives on their own, the following collaboration among member countries in the Region and the World is highly recommended: develop a formal network, and where appropriate, in sub-groups of countries (for instance, the WHO Western Pacific Region) according to the magnitude of the problem and level of resources. The network should work to continuously disseminate information; promote research; exchange culture-specific understanding of suicides, as well as the different approaches to dealing with it; share human resource and technical expertise; and to actively support the implementation and evaluation of mental health and suicide prevention programmes. This may be achieved through education and training (including familiarization with ICD-10 categories); developing a common instrument for suicide surveillance that can be implemented in the region, or sub-regions, in order to standardize suicide reporting and thus permit the observation of regional or sub-regional trends (including trends in attempted suicide and methods of self-injury); and develop a collaborative research proposal to share current knowledge, generate a better understanding of the suicide problem at country levels, foster advocacy, and establish and evaluate prevention programmes.

Because of lack of funding, human resources, etc in developing countries, for example in Vietnam, integrating mental health care as well as suicide prevention into primary health care is a cost-effective suggestion.

## **5.8 FUTURE RESEARCH**

There is always a desire for further research and more studies. There are, however, a few types of studies which I find particularly important within the field of suicide prevention. Firstly, apart from developing new and better methods for detecting mental health problems in the community as well as suicide attempters, continuing research should also focus on building up valuable technical guidance and protocols to effectively organize health services in order to meet the population's need for mental health care. Secondly, developing human resources needed to maintain a valid and reliable data collection system on morbidity and mortality including suicide. And, complementing the surveillance system with research on the causes, risk and protective factors for suicide is always important. Thirdly, there is also need of research on mental health systems relevant for the Vietnamese and Eastern Asian context, integrating mental health into primary health care systems, and evaluating different forms of outreach to persons with mental health problems.

## 6 CONCLUSIONS AND RECOMMENDATIONS

This thesis has provided an additional understanding of epidemiology and characteristics of suicide attempts in Vietnam. Since Vietnam is a country with a rapid economic development and social transitions, our findings are relevant for many South East Asian countries and are of great interest for other countries in the region and the world.

We confirmed the value of SRQ-20 for use in developing countries. The optimal cut-off limit has to be assessed and determined according to local conditions and different cut-off points could be used for different purposes. The instrument can also be used to collect and report data on mental health problems in epidemiological survey and public health reports.

Most suicide attempters have a psychiatric illness although the large majority has not had contact with psychiatric care. The occurrence of suicide attempts is especially high among young people. Thus, young individuals should be targeted in strategies aiming at preventing suicides. Accessibility and availability of psychiatric treatment is a key issue, but also early detection and follow-up. A national policy highlighting training and awareness of mental health problems in the community should be advocated.

The majority of suicide attempts are performed by use of pesticides, which is an important target for preventive strategies. Strategies for suicide prevention should comprise limiting the access to pesticides by, for example, raising public awareness of the need to keep these potential poisons safely locked in and available only to authorized persons. The increasing use of pharmaceutical drugs as means of suicide and attempted suicide also indicates a need for stronger regulation of the accessibility to these drugs. Improved access to mental health services possibly by integrating into primary health care could help a proper management of psychotropic drugs. Policy makers should be aware of the risk of “swapping” to other methods, which is why limiting access to means of suicide only can be a part of any suicide prevention program.

The risk of re-attempt and completed suicide is increased among patients who have attempted suicide, also in Vietnam. Pharmaceutical drugs were the main method used in re-attempts, whereas completed suicide mainly was performed by pesticides or hanging. Mental health services should be strengthened to take care of and follow-up persons with mental health problems as well as those who have attempted suicide. Better access to mental health care should be prioritized for this group, possibly by integration of mental health care into primary health care.

## 7 ACKNOWLEDGEMENTS

The studies presented in this thesis are a part of collaboration between Vietnam (Hanoi Medical University) and Sweden (Karolinska Institutet). Sida/SAREC has provided financial support for this project.

*I would like to express my special gratitude to:*

Professor **Peter Allebeck**, my main supervisor, whose encouragement, guidance and support from the initial to the final level enabled me to develop an understanding of the subject. Throughout my thesis-writing period, he provided sound advice, good teaching, good company, and lots of good ideas. I would have been lost without him. He is the best supervisor I could ever have wished for.

Associate Professor **Nguyen Viet Thiem**, the former Head of the Department of Psychiatry, Hanoi Medical University, and Associate Professor **Tran Viet Nghi**, the former Director of National Institute of Mental Health - Bach Mai Hospital, my Vietnamese supervisors, who introduced me to join the project and supported me during my time in Hanoi. Their ideals and concepts have had a remarkable influence on my entire career in the field of research.

Dr **Christina Dalman**, my co-supervisor, for her effort in revising my manuscripts and thesis, for valuable advice and constructive criticism of this study.

Associate Professor **Nguyen Van Tuong**, Vietnamese coordinator, for providing me with a great opportunity to participate in the project and for his generous support and arrangement from me during the PhD course.

Associate Professor **Ingeborg van de Ploeg**, Swedish scientific coordinator, for her external mentor, for her enthusiasm in the common disease project, for your arrangement and support to me and all other Vietnamese students.

Professor **Nguyen Lan Viet**, Associate Professor **Nguyen Duc Hinh** at the Hanoi Medical University for accepting me as a PhD student in the common disease project, for your kindness, support and encouragement.

Associate Professor **Tran Huu Binh**, Director of National Institute of Mental Health, Bach Mai Hospital, Dr **Nguyen Kim Viet**, Head of Psychiatry Department, Hanoi Medical University, for helping me and making this thesis possible.

Associate Professor **Ta Thanh Van**, PhD. **Dang Thi Ngoc Dung**, Mr. **Nong Ngoc Huy**, Mrs. **Nguyen Thu Huong**, Mrs. **Monica Grangien**, Mrs. **Maissa Al-Adhami**, Ms. **Silsa Heilborn** and Mrs **Elisabeth Johansson**, Ms. **Tran Thi Minh Van** for coordination and administration.

Dr **Kim Bao Giang**, Dr **Tran Thi Thanh Huong**, Dr **Le Cong Thien** and Dr **Hoang Hoa Son**, for helping me to plan my field studies, giving me comments, analyze data and good collaborators.

PhD **Anna Sidorchuk**, Mrs **Emilie Agardh**, Dr **Edison Manrique-Garcia**, Dr **Diddy Antai**, Dr **Nakasujja Noeline**, Dr **Paul Bangirana**, Mrs **Karin Guldbbrandsson** and Dr **Vu Hong Thang**, for sharing and commenting on my story cover and thesis presentation.

The past or present members at **Division of Social Medicine**, Department of Public Health Sciences, Karolinska Institutet for encouragement during my graduate study.

The past or present members at **Division of Public Health Epidemiology**, Department of Public Health Sciences, Karolinska Institutet for encouragement during my graduate study.

The past or present members at the **Department of Psychiatry**, Hanoi Medical University for sharing scientific knowledge, providing time and creating extremely nice working atmosphere.

The past or present members at **National Institute of Mental Health**, Bach Mai Hospital, for sharing scientific knowledge, providing time and creating extremely nice working environment.

**Filabavi Office** of Filabavi Project in Ba Vi, **Center for Poison Control** of Bach Mai Hospital, **District Health Centers** of Gia Luong for helping with fieldworks, the interviews and recruitment of the patients and analyses of the data

**Karolinska Institutet Research Training program**, **the Swedish International Development Cooperation Agency**, **Sida/SAREC** and **the Karolinska Institutet Funding** for supporting grants.

**My family** for their unflagging love and support throughout my life. My parents, they had never complained in spite of all the hardships in their life to support for my study. I cannot ask for more from them since they are simply perfect. I feel proud of my wife for her understanding, supports and suffering through my frequent absence without complaints. I owe my loving thanks to my sons for their inspiration and joyfulness. They have lost a lot due to my research abroad. Thank you for their love and constant support especially when I was in Sweden.

I lastly offer my regards and blessings to all of those who supported me in any respect during the completion of the project.

## 8 REFERENCES

1. De Leo D, Burgis S, Bertolote JM, Kerkhof A, Bille-Brahne U. Definitions of suicidal behaviours. Cambridge: Hogrefe & Huber; 2004.
2. WHO. Summary report, working group in preventive practices in suicide and attempted suicide. 1986.
3. Farberow N, Shneidman ES. The cry for help. United States of America: McGraw-Hill Book Company; 1961.
4. Tran TTH. Attempted Suicide in Vietnam. Stockholm: Karolinska University Press; 2006.
5. Stengel E. Suicide and attempted suicide. United Kingdom: C.Nicols & Company Ltd; 1975.
6. Durkheim E. Suicide. London: Routledge and Kegan Paul; 1897.
7. Shneidman ES. Definition of Suicide. New Jersey: Jason Aronson Incorporated; 1985.
8. Maris R, Silverman M. The theoretical component in Suicidology. Comprehensive textbook of suicidology. New York: Guilford Press; 2000.
9. Wasserman D, Narboni V. Guidelines for suicide prevention in schools. Stockholm: NASP; 2001.
10. Rodriguez AH, Caldera T, Kullgren G, Renberg ES. Suicidal expressions among young people in Nicaragua: a community-based study. *Soc Psychiatry Psychiatr Epidemiol.* 2006 Sep;41(9):692-7.
11. Wolk-Wasserman D. Suicidal communication of persons attempting suicide and responses of significant others. *Acta Psychiatr Scand.* 1986 May;73(5):481-99.
12. Wasserman D. A stress-vulnerability model and the development of the suicide process. *Suicide an unnecessary death.*: Martin Dunitz; 2001.
13. Mann JJ. The neurobiology of suicide. *Nat Med.* 1998 Jan;4(1):25-30.
14. Rubenstein JL, Halton A, Kasten L, Rubin C, Stechler G. Suicidal behavior in adolescents: stress and protection in different family contexts. *Am J Orthopsychiatry.* 1998 Apr;68(2):274-84.
15. Fei W. Suicide in different cultures and religions-cultural traditions in China. Unpublished. 2006.
16. Mann JJ, Apter A, Bertolote J, Beautrais A, Currier D, Haas A, et al. Suicide prevention strategies: a systematic review. *JAMA.* 2005 Oct 26;294(16):2064-74.
17. WHO Western Pacific Region W. Conclusion of the meeting on suicide prevention. 2005. 2005.
18. Henriksson MM, Aro HM, Marttunen MJ, Heikkinen ME, Isometsa ET, Kuoppasalmi KI, et al. Mental disorders and comorbidity in suicide. *Am J Psychiatry.* 1993 Jun;150(6):935-40.
19. Wasserman D. Affective disorders and suicide. *Suicide an unnecessary death.* Stockholm: Martin Dunitz; 2001.

20. Blair-West GW, Mellsop GW, Eyeson-Annan ML. Down-rating lifetime suicide risk in major depression. *Acta Psychiatr Scand.* 1997 Mar;95(3):259-63.
21. Wulsin LR, Vaillant GE, Wells VE. A systematic review of the mortality of depression. *Psychosom Med.* 1999 Jan-Feb;61(1):6-17.
22. Rihmer Z, Barsi J, Arato M, Demeter E. Suicide in subtypes of primary major depression. *J Affect Disord.* 1990 Mar;18(3):221-5.
23. Buchholtz-Hansen PE, Wang AG, Kragh-Sorensen P. Mortality in major affective disorder: relationship to subtype of depression. The Danish University Antidepressant Group. *Acta Psychiatr Scand.* 1993 May;87(5):329-35.
24. Kessler RC, McGonagle KA, Zhao S, Nelson CB, Hughes M, Eshleman S, et al. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. Results from the National Comorbidity Survey. *Arch Gen Psychiatry.* 1994 Jan;51(1):8-19.
25. Modestin J, Kopp W. Study on suicide in depressed inpatients. *J Affect Disord.* 1988 Sep-Oct;15(2):157-62.
26. Conwell Y, Duberstein PR, Cox C, Herrmann JH, Forbes NT, Caine ED. Relationships of age and axis I diagnoses in victims of completed suicide: a psychological autopsy study. *Am J Psychiatry.* 1996 Aug;153(8):1001-8.
27. Kendler KS, Kessler RC, Neale MC, Heath AC, Eaves LJ. The prediction of major depression in women: toward an integrated etiologic model. *Am J Psychiatry.* 1993 Aug;150(8):1139-48.
28. Fawcett J, Scheftner WA, Fogg L, Clark DC, Young MA, Hedeker D, et al. Time-related predictors of suicide in major affective disorder. *Am J Psychiatry.* 1990 Sep;147(9):1189-94.
29. Rutz W, Walinder J, Rihmer Z, Pestaloty P. [Male depression--stress reaction combined with serotonin deficiency?]. *Lakartidningen.* 1999 Mar 10;96(10):1177-8.
30. Lester D. Suicidal behavior in bipolar and unipolar affective disorders: a meta-analysis. *J Affect Disord.* 1993 Feb;27(2):117-21.
31. Simpson SG, Jamison KR. The risk of suicide in patients with bipolar disorders. *J Clin Psychiatry.* 1999;60 Suppl 2:53-6; discussion 75-6, 113-6.
32. Keeley HS, Corcoran P, Bille-Brahe U. *Addiction and Suicidal Behaviour: Question and Answers in the EPSIS. Suicidal Behaviour.:* Hogrefe & Huber; 2004.
33. McQuillan CT, Rodriguez J. Adolescent suicide: a review of the literature. *Bol Asoc Med P R.* 2000 Jan-Mar;92(1-3):30-8.
34. Neeleman J, Farrell M. Suicide and substance misuse. *Br J Psychiatry.* 1997 Oct;171:303-4.
35. Inskip HM, Harris EC, Barraclough B. Lifetime risk of suicide for affective disorder, alcoholism and schizophrenia. *Br J Psychiatry.* 1998 Jan;172:35-7.
36. Oyefeso A, Ghodse H, Clancy C, Corkery JM. Suicide among drug addicts in the UK. *Br J Psychiatry.* 1999 Sep;175:277-82.
37. Ohberg A, Vuori E, Ojanpera I, Lonngvist J. Alcohol and drugs in suicides. *Br J Psychiatry.* 1996 Jul;169(1):75-80.

38. Wasserman D. Alcoholism, other psychoactive substance misuse and suicide. Stockholm: Martin Dunitz; 2001.
39. Pirkola SP, Marttunen MJ, Henriksson MM, Isometsa ET, Heikkinen ME, Lonnqvist JK. Alcohol-related problems among adolescent suicides in Finland. *Alcohol Alcohol*. 1999 May-Jun;34(3):320-9.
40. Wasserman D. Negative life events (loses, changes, traumas and narcissistic injury) and suicide. *Suicide an unnecessary death*. Stockholm: Martin Dunitz; 2001.
41. Fawcett J. Predictors of early suicide: identification and appropriate intervention. *J Clin Psychiatry*. 1988 Oct;49 Suppl:7-8.
42. Fawcett J, Busch KA, Jacobs D, Kravitz HM, Fogg L. Suicide: a four-pathway clinical-biochemical model. *Ann N Y Acad Sci*. 1997 Dec 29;836:288-301.
43. Wasserman D. The anxiety disorders, anxiety symptoms and suicide. Stockholm: Martin Dunitz; 2001.
44. Hall RC, Platt DE. Suicide risk assessment: a review of risk factors for suicide in 100 patients who made severe suicide attempts. Evaluation of suicide risk in a time of managed care. *Psychosomatics*. 1999 Jan-Feb;40(1):18-27.
45. Emborg C. Mortality and causes of death in eating disorders in Denmark 1970-1993: a case register study. *Int J Eat Disord*. 1999 Apr;25(3):243-51.
46. Neumarker KJ. Mortality and sudden death in anorexia nervosa. *Int J Eat Disord*. 1997 Apr;21(3):205-12.
47. Nielsen S, Moller-Madsen S, Isager T, Jorgensen J, Pagsberg K, Theander S. Standardized mortality in eating disorders--a quantitative summary of previously published and new evidence. *J Psychosom Res*. 1998 Mar-Apr;44(3-4):413-34.
48. Patton GC. Mortality in eating disorders. *Psychol Med*. 1988 Nov;18(4):947-51.
49. Wasserman D. Eating disorders and suicide. *Suicide an unnecessary death*. Stockholm: Martin Dunitz; 2001.
50. Apter A, Bleich A, King RA, Kron S, Fluch A, Kotler M, et al. Death without warning? A clinical postmortem study of suicide in 43 Israeli adolescent males. *Arch Gen Psychiatry*. 1993 Feb;50(2):138-42.
51. Wasserman D. Adjustment disorder and suicide. *Suicide an unnecessary death*. Stockholm: Martin Dunitz; 2001.
52. Runeson BS. Youth suicides unknown to psychiatric care providers. *Suicide Life Threat Behav*. 1992 Winter;22(4):494-503.
53. Bronisch T. Adjustment reactions: a long-term prospective and retrospective follow-up of former patients in a crisis intervention ward. *Acta Psychiatr Scand*. 1991 Jul;84(1):86-93.
54. Westermeyer JF, Harrow M, Marengo JT. Risk for suicide in schizophrenia and other psychotic and nonpsychotic disorders. *J Nerv Ment Dis*. 1991 May;179(5):259-66.
55. Wasserman D. Schizophrenia, other psychotic states and suicide. *Suicide an unnecessary death*. Stockholm: Dunitz; 2001.
56. Addington DE, Addington JM. Attempted suicide and depression in schizophrenia. *Acta Psychiatr Scand*. 1992 Apr;85(4):288-91.

57. Dassori AM, Mezzich JE, Keshavan M. Suicidal indicators in schizophrenia. *Acta Psychiatr Scand.* 1990 May;81(5):409-13.
58. Heila H, Isometsa ET, Henriksson MM, Heikkinen ME, Marttunen MJ, Lonnqvist JK. Suicide and schizophrenia: a nationwide psychological autopsy study on age- and sex-specific clinical characteristics of 92 suicide victims with schizophrenia. *Am J Psychiatry.* 1997 Sep;154(9):1235-42.
59. Rossau CD, Mortensen PB. Risk factors for suicide in patients with schizophrenia: nested case-control study. *Br J Psychiatry.* 1997 Oct;171:355-9.
60. Drake RE, Gates C, Cotton PG. Suicide among schizophrenics: a comparison of attempters and completed suicides. *Br J Psychiatry.* 1986 Dec;149:784-7.
61. Isometsa ET, Henriksson MM, Heikkinen ME, Aro HM, Marttunen MJ, Kuoppasalmi KI, et al. Suicide among subjects with personality disorders. *Am J Psychiatry.* 1996 May;153(5):667-73.
62. Wasserman D. *Personality disorders and suicide. Suicide an unnecessary death.* Stockholm: Martin Dunitz; 2001.
63. Schmidtke A, Bille-Brahe U, DeLeo D, Kerkhof A, Bjerke T, Crepet P, et al. Attempted suicide in Europe: rates, trends and sociodemographic characteristics of suicide attempters during the period 1989-1992. Results of the WHO/EURO Multicentre Study on Parasuicide. *Acta Psychiatr Scand.* 1996 May;93(5):327-38.
64. Arensman E, Howton K. *Suicidal behaviour among young people. Suicidal behaviour.*: Hogrefe & Huber; 2004.
65. Allebeck P, Allgulander C, Fisher LD. Predictors of completed suicide in a cohort of 50,465 young men: role of personality and deviant behaviour. *BMJ.* 1988 Jul 16;297(6642):176-8.
66. Tidemalm D, Langstrom N, Lichtenstein P, Runeson B. Risk of suicide after suicide attempt according to coexisting psychiatric disorder: Swedish cohort study with long term follow-up. *BMJ.* 2008;337:a2205.
67. WHO. *The International Classification of Diseases version 10 (in Vietnamese).* 1992.
68. Thanh HT, Jiang GX, Van TN, Minh DP, Rosling H, Wasserman D. Attempted suicide in Hanoi, Vietnam. *Soc Psychiatry Psychiatr Epidemiol.* 2005 Jan;40(1):64-71.
69. Yamada T, Kawanishi C, Hasegawa H, Sato R, Konishi A, Kato D, et al. Psychiatric assessment of suicide attempters in Japan: a pilot study at a critical emergency unit in an urban area. *BMC Psychiatry.* 2007;7:64.
70. Tsoi WF, Kua EH. Suicide following parasuicide in Singapore. *Br J Psychiatry.* 1987 Oct;151:543-5.
71. Oliver RG. Rise and fall of suicide rates in Australia: relation to sedative availability. *Med J Aust.* 1972 Nov 18;2(21):1208-9.
72. Kreitman N. The coal gas story. United Kingdom suicide rates, 1960-71. *Br J Prev Soc Med.* 1976 Jun;30(2):86-93.
73. Wasserman D, Varnik A. Suicide-preventive effects of perestroika in the former USSR: the role of alcohol restriction. *Acta Psychiatr Scand Suppl.* 1998;394:1-4.

74. Gunnell D, Middleton N, Frankel S. Method availability and the prevention of suicide--a re-analysis of secular trends in England and Wales 1950-1975. *Soc Psychiatry Psychiatr Epidemiol.* 2000 Oct;35(10):437-43.
75. Lester D. The effects of detoxification of domestic gas on suicide in the United States. *Am J Public Health.* 1990 Jan;80(1):80-1.
76. Ohberg A, Lonnqvist J, Sarna S, Vuori E, Penttila A. Trends and availability of suicide methods in Finland. Proposals for restrictive measures. *Br J Psychiatry.* 1995 Jan;166(1):35-43.
77. Isometsa ET, Lonnqvist JK. Suicide attempts preceding completed suicide. *Br J Psychiatry.* 1998 Dec;173:531-5.
78. Platt S, Bille-Brahe U, Kerkhof A, Schmidtke A, Bjerke T, Crepet P, et al. Parasuicide in Europe: the WHO/EURO multicentre study on parasuicide. I. Introduction and preliminary analysis for 1989. *Acta Psychiatr Scand.* 1992 Feb;85(2):97-104.
79. Bille-Brahe U, Jessen G. Repeated suicidal behavior: a two-year follow-up. *Crisis.* 1994;15(2):77-82.
80. Rynestad T. A prospective 5-year follow-up study of self-poisoned patients. *Acta Psychiatr Scand.* 1988 Mar;77(3):328-31.
81. Runeson B, Tidemalm D, Dahlin M, Lichtenstein P, Langstrom N. Method of attempted suicide as predictor of subsequent successful suicide: national long term cohort study. *BMJ.* 341:c3222.
82. Hawton K, Fagg J. Suicide, and other causes of death, following attempted suicide. *Br J Psychiatry.* 1988 Mar;152:359-66.
83. Arensman E, Kerkhof JF. Classification of attempted suicide: a review of empirical studies, 1963-1993. *Suicide Life Threat Behav.* 1996 Spring;26(1):46-67.
84. Hjelmeland H. Repetition of parasuicide: a predictive study. *Suicide Life Threat Behav.* 1996 Winter;26(4):395-404.
85. Beautrais AL. Suicide in Asia. *Crisis.* 2006;27(2):55-7.
86. Adityanjee DR. Suicide attempts and suicides in India: cross-cultural aspects. *Int J Soc Psychiatry.* 1986 Summer;32(2):64-73.
87. Vijayakumar L, Rajkumar S. Are risk factors for suicide universal? A case-control study in India. *Acta Psychiatr Scand.* 1999 Jun;99(6):407-11.
88. Phillips MR, Li X, Zhang Y. Suicide rates in China, 1995-99. *Lancet.* 2002 Mar 9;359(9309):835-40.
89. Wasserman D, Cheng Q, Jiang GX. Global suicide rates among young people aged 15-19. *World Psychiatry.* 2005 Jun;4(2):114-20.
90. Vietnam MoHi. Yearbook of Health Statistics. Hanoi: Medical Publishing House (in Vietnamese); 2000.
91. Welch SS. A review of the literature on the epidemiology of parasuicide in the general population. *Psychiatr Serv.* 2001 Mar;52(3):368-75.
92. Bland RC, Newman SC, Dyck RJ. The epidemiology of parasuicide in Edmonton. *Can J Psychiatry.* 1994 Oct;39(8):391-6.

93. Weissman MM, Bland RC, Canino GJ, Greenwald S, Hwu HG, Joyce PR, et al. Prevalence of suicide ideation and suicide attempts in nine countries. *Psychol Med.* 1999 Jan;29(1):9-17.
94. Chiu LP. Attempted suicide in Hong Kong. *Acta Psychiatr Scand.* 1989 May;79(5):425-30.
95. Pan PC, Lieh-Mak F. A comparison between male and female parasuicides in Hong Kong. *Soc Psychiatry Psychiatr Epidemiol.* 1989 Sep;24(5):253-7.
96. Wai BH, Heok KE. Parasuicide: a Singapore perspective. *Ethn Health.* 1998 Nov;3(4):255-63.
97. Fleischmann A, Bertolote JM, De Leo D, Botega N, Phillips M, Sisask M, et al. Characteristics of attempted suicides seen in emergency-care settings of general hospitals in eight low- and middle-income countries. *Psychol Med.* 2005 Oct;35(10):1467-74.
98. 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.
99. Cheung YB, Law CK, Chan B, Liu KY, Yip PS. Suicidal ideation and suicidal attempts in a population-based study of Chinese people: risk attributable to hopelessness, depression, and social factors. *J Affect Disord.* 2006 Feb;90(2-3):193-9.
100. Chen PC, Lee LK, Wong KC, Kaur J. Factors relating to adolescent suicidal behavior: a cross-sectional Malaysian school survey. *J Adolesc Health.* 2005 Oct;37(4):337.
101. Lee MT, Wong BP, Chow BW, McBride-Chang C. Predictors of suicide ideation and depression in Hong Kong adolescents: perceptions of academic and family climates. *Suicide Life Threat Behav.* 2006 Feb;36(1):82-96.
102. Wasserman D. Strategy in suicide prevention. *Suicide an unnecessary death.* Martin Dunitz; 2001.
103. Goldman LS, Nielsen NH, Champion HC. Awareness, diagnosis, and treatment of depression. *J Gen Intern Med.* 1999 Sep;14(9):569-80.
104. Luoma JB, Martin CE, Pearson JL. Contact with mental health and primary care providers before suicide: a review of the evidence. *Am J Psychiatry.* 2002 Jun;159(6):909-16.
105. Rutz W, von Knorring L, Walinder J. Long-term effects of an educational program for general practitioners given by the Swedish Committee for the Prevention and Treatment of Depression. *Acta Psychiatr Scand.* 1992 Jan;85(1):83-8.
106. Lonnqvist JK, Henriksson MM, Isometsa ET, Marttunen MJ, Heikkinen ME, Aro HM, et al. Mental disorders and suicide prevention. *Psychiatry Clin Neurosci.* 1995 May;49 Suppl 1:S111-6.
107. Coyle JT, Pine DS, Charney DS, Lewis L, Nemeroff CB, Carlson GA, et al. Depression and bipolar support alliance consensus statement on the unmet needs in diagnosis and treatment of mood disorders in children and adolescents. *J Am Acad Child Adolesc Psychiatry.* 2003 Dec;42(12):1494-503.
108. Oquendo MA, Kamali M, Ellis SP, Grunebaum MF, Malone KM, Brodsky BS, et al. Adequacy of antidepressant treatment after discharge and the occurrence of

- suicidal acts in major depression: a prospective study. *Am J Psychiatry*. 2002 Oct;159(10):1746-51.
109. Rutz W, von Knorring L, Pihlgren H, Rihmer Z, Walinder J. Prevention of male suicides: lessons from Gotland study. *Lancet*. 1995 Feb 25;345(8948):524.
  110. Chopin E, Kerkhof A, Arensman E. Psychological dimensions of attempted suicide: Theories and data. *Suicidal behaviour*. Hogrefe & Huber; 2004.
  111. Brown GK, Ten Have T, Henriques GR, Xie SX, Hollander JE, Beck AT. Cognitive therapy for the prevention of suicide attempts: a randomized controlled trial. *JAMA*. 2005 Aug 3;294(5):563-70.
  112. Guthrie E, Kapur N, Mackway-Jones K, Chew-Graham C, Moorey J, Mendel E, et al. Randomised controlled trial of brief psychological intervention after deliberate self poisoning. *BMJ*. 2001 Jul 21;323(7305):135-8.
  113. Keller MB, Lavori PW, Rice J, Coryell W, Hirschfeld RM. The persistent risk of chronicity in recurrent episodes of nonbipolar major depressive disorder: a prospective follow-up. *Am J Psychiatry*. 1986 Jan;143(1):24-8.
  114. Vergouwen AC, Bakker A, Katon WJ, Verheij TJ, Koerselman F. Improving adherence to antidepressants: a systematic review of interventions. *J Clin Psychiatry*. 2003 Dec;64(12):1415-20.
  115. Oquendo MA, Galfalvy H, Russo S, Ellis SP, Grunebaum MF, Burke A, et al. Prospective study of clinical predictors of suicidal acts after a major depressive episode in patients with major depressive disorder or bipolar disorder. *Am J Psychiatry*. 2004 Aug;161(8):1433-41.
  116. Goldacre M, Seagroatt V, Hawton K. Suicide after discharge from psychiatric inpatient care. *Lancet*. 1993 Jul 31;342(8866):283-6.
  117. Oquendo MA, Malone KM, Ellis SP, Sackeim HA, Mann JJ. Inadequacy of antidepressant treatment for patients with major depression who are at risk for suicidal behavior. *Am J Psychiatry*. 1999 Feb;156(2):190-4.
  118. Wells K, Sherbourne C, Duan N, Unutzer J, Miranda J, Schoenbaum M, et al. Quality improvement for depression in primary care: do patients with subthreshold depression benefit in the long run? *Am J Psychiatry*. 2005 Jun;162(6):1149-57.
  119. Gunnell D, Eddleston M, Phillips MR, Konradsen F. The global distribution of fatal pesticide self-poisoning: systematic review. *BMC Public Health*. 2007;7:357.
  120. Loftin C, McDowall D, Wiersema B, Cottey TJ. Effects of restrictive licensing of handguns on homicide and suicide in the District of Columbia. *N Engl J Med*. 1991 Dec 5;325(23):1615-20.
  121. [http://en.wikipedia.org/wiki. List\\_of\\_countries\\_by\\_population](http://en.wikipedia.org/wiki/List_of_countries_by_population). 2010 [updated 2010; cited]; Available from.
  122. [http://en.wikipedia.org/wiki. List\\_of\\_countries\\_by\\_GDP\\_%28PPP%29\\_per\\_capita](http://en.wikipedia.org/wiki/List_of_countries_by_GDP_%28PPP%29_per_capita). 2009 [updated 2009; cited]; Available from.
  123. [http://en.wikipedia.org/wiki. List\\_of\\_countries\\_by\\_real\\_GDP\\_growth\\_rate](http://en.wikipedia.org/wiki/List_of_countries_by_real_GDP_growth_rate). 2009 [updated 2009; cited]; Available from.
  124. Vietnam MoHo. Vietnam Health Report 2002. Medical Publishing House in Hanoi. 2002.

125. Kim BG. Assessing health problems: self-reported illness, mental distress and alcohol problems in a rural district in Vietnam. Stockholm: Reproprint AB; 2006.
126. <http://www.moh.gov.vn/homeby/vn/portal/infolist.jsp?area=58&cat=1450>. 2006 [updated 2006; cited]; Available from.
127. Tran VN. Developing mental health care strategies in Vietnam. National Workshop on Mental Health Care and Suicide Prevention Ministry of Health of Vietnam Hue. 2004.
128. Vietnam Health Report 2002. Medical Publishing House in Hanoi. Ministry of Health of Vietnam, 2002.
129. <http://www.medicalnewstoday.com/articles/124897.php>. 2008 [updated 2008; cited]; Available from.
130. Nguyen TKC, Diwan KV. FilaBavi, a demographic surveillance site, an epidemiological field laboratory in Vietnam. *Scandinavian Journal of Public Health*. 2003;31(Suppl 62):3-7.
131. <http://BacNinh province. gov.vn> [database on the Internet]. 2008 [cited].
132. Araya R, Wynn R, Lewis G. Comparison of two self administered psychiatric questionnaires (GHQ-12 and SRQ-20) in primary care in Chile. *Soc Psychiatry Psychiatr Epidemiol*. 1992 Aug;27(4):168-73.
133. Harding TW, de Arango MV, Baltazar J, Climent CE, Ibrahim HH, Ladrigo-Ignacio L, et al. Mental disorders in primary health care: a study of their frequency and diagnosis in four developing countries. *Psychol Med*. 1980 May;10(2):231-41.
134. Mari JJ, Williams P. Misclassification by psychiatric screening questionnaires. *J Chronic Dis*. 1986;39(5):371-8.
135. Orley J, Wing JK. Psychiatric disorders in two African villages. *Arch Gen Psychiatry*. 1979 May;36(5):513-20.
136. WHO. Composite International Diagnostic Interview (CIDI). Core Version 2.1. Geneva: World Health Organization; 1997.
137. WHO. A User's Guidelines to the Self Reporting Questionnaires (SRQ). Geneva: World Health Organization; 1994.
138. Al-Subaie AS, Mohammed K, Al-Malik T. The Arabic self-reporting questionnaire (SRQ) as a psychiatric screening instrument in medical patients. *Ann Saudi Med*. 1998 Jul-Aug;18(4):308-10.
139. Alem A, Kebede D, Kullgren G. The prevalence and socio-demographic correlates of khat chewing in Butajira, Ethiopia. *Acta Psychiatr Scand Suppl*. 1999;397:84-91.
140. Penayo U, Kullgren G, Caldera T. Mental disorders among primary health care patients in Nicaragua. *Acta Psychiatr Scand*. 1990 Jul;82(1):82-5.
141. Sartorius N, Janca A. Psychiatric assessment instruments developed by the World Health Organization. *Soc Psychiatry Psychiatr Epidemiol*. 1996 Mar;31(2):55-69.
142. WHO. A user's guide to the Self Reporting Questionnaire (SRQ). Geneva: World Health Organization; 1994.
143. Kortmann F, ten Horn S. Comprehension and motivation in responses to a psychiatric screening instrument. Validity of the SRQ in Ethiopia. *Br J Psychiatry*. 1988 Jul;153:95-101.

144. Ghubash R, Daradkeh T, El-Rufaie OF, Abou-Saleh MT. A comparison of the validity of two psychiatric screening questionnaires: the Arabic General Health Questionnaire (AGHQ) and Self-Reporting Questionnaire (SRQ-20) in UAE, using Receiver Operating Characteristic (ROC) analysis. *Eur Psychiatry*. 2001 Mar;16(2):122-6.
145. Mari JJ, Williams P. A comparison of the validity of two psychiatric screening questionnaires (GHQ-12 and SRQ-20) in Brazil, using Relative Operating Characteristic (ROC) analysis. *Psychol Med*. 1985 Aug;15(3):651-9.
146. Iacoponi E, Mari JJ. Reliability and factor structure of the Portuguese version of Self-Reporting Questionnaire. *Int J Soc Psychiatry*. 1989 Autumn;35(3):213-22.
147. Lee S, Fung SC, Tsang A, Liu ZR, Huang YQ, He YL, et al. Lifetime prevalence of suicide ideation, plan, and attempt in metropolitan China. *Acta Psychiatr Scand*. 2007 Dec;116(6):429-37.
148. Bertolote JM, Fleischmann A, De Leo D, Bolhari J, Botega N, De Silva D, et al. Suicide attempts, plans, and ideation in culturally diverse sites: the WHO SUPREMISS community survey. *Psychol Med*. 2005 Oct;35(10):1457-65.
149. Odejide AO, Williams AO, Ohaeri JU, Ikuesan BA. The epidemiology of deliberate self-harm. The Ibadan experience. *Br J Psychiatry*. 1986 Dec;149:734-7.
150. Bertolote JM, Fleischmann A, De Leo D, Wasserman D. Psychiatric diagnoses and suicide: revisiting the evidence. *Crisis*. 2004;25(4):147-55.
151. Vanruni de Silva, Ratnayake A. Increased Use of Medicinal Drugs in Self-Harm in Urban Areas in Sri Lanka. *Archives of Suicide Research*. 2008(12):366-9.
152. Nguyen VT, Dalman D, Nguyen VT, Tran VT, P. A. Suicide attempts by poisoning in Hanoi, Vietnam: Methods used, mental problems and history of mental health care. *Archives of Suicide Research*. 2009;13(4):1-10.
153. Nguyen VT, Dalman C, Le CT, Nguyen VT, Tran VN, Allebeck P. Suicide attempt in a rural area of Vietnam: Incidence, methods used and access to mental health care. *International Journal of Mental Health System*. 2010.
154. Gilbody S, House A, Owens D. The early repetition of deliberate self harm. *J R Coll Physicians Lond*. 1997 Mar-Apr;31(2):171-2.
155. Appleby L, Shaw J, Amos T, McDonnell R, Harris C, McCann K, et al. Suicide within 12 months of contact with mental health services: national clinical survey. *BMJ*. 1999 May 8;318(7193):1235-9.
156. Bancroft J, Marsack P. The repetitiveness of self-poisoning and self-injury. *Br J Psychiatry*. 1977 Oct;131:394-9.
157. Carter GL, Whyte IM, Ball K, Carter NT, Dawson AH, Carr VJ, et al. Repetition of deliberate self-poisoning in an Australian hospital-treated population. *Med J Aust*. 1999 Apr 5;170(7):307-11.
158. Hassanyeh F, O'Brien G, Holton AR, Hurren K, Watt L. Repeat self-harm: an 18-month follow-up. *Acta Psychiatr Scand*. 1989 Mar;79(3):265-7.
159. Nordentoft M, Breum L, Munck LK, Nordestgaard AG, Hunding A, Laursen Bjaeldager PA. High mortality by natural and unnatural causes: a 10 year follow up study of patients admitted to a poisoning treatment centre after suicide attempts. *BMJ*. 1993 Jun 19;306(6893):1637-41.

160. Giang KB, Allebeck P, Kullgren G, Tuan NV. The Vietnamese version of the Self Reporting Questionnaire 20 (SRQ-20) in detecting mental disorders in rural Vietnam: a validation study. *Int J Soc Psychiatry*. 2006 Mar;52(2):175-84.
161. Persson ML, Runeson BS, Wasserman D. Diagnoses, psychosocial stressors and adaptive functioning in attempted suicide. *Ann Clin Psychiatry*. 1999 Sep;11(3):119-28.
162. Barr W, Leitner M, Thomas J. Short shrift for the sane? The hospital management of self-harm patients with and without mental illness. *J Psychiatr Ment Health Nurs*. 2004 Aug;11(4):401-6.
163. Kumar CT, Mohan R, Ranjith G, Chandrasekaran R. Characteristics of high intent suicide attempters admitted to a general hospital. *J Affect Disord*. 2006 Mar;91(1):77-81.
164. Suominen K, Lonnqvist J. Determinants of psychiatric hospitalization after attempted suicide. *Gen Hosp Psychiatry*. 2006 Sep-Oct;28(5):424-30.
165. Nguyen MT, Tran VN, Than VT, al e. Applying Albernil Therapy among 384 Heroin Dependent Out-Patients at Bach Mai Hospital, Vietnam. *Clinical Medical Journal of Bach Mai Hospital*. 2006;01:34-7.
166. Cedereke M, Ojehagen A. Formal and informal help during the year after a suicide attempt: a one-year follow-up. *Int J Soc Psychiatry*. 2007 Sep;53(5):419-29.
167. Ojehagen A, Regnell G, Traskman-Bendz L. Deliberate self-poisoning: repeaters and nonrepeaters admitted to an intensive care unit. *Acta Psychiatr Scand*. 1991 Sep;84(3):266-71.
168. Gunnell D, Bennewith O, Peters TJ, Stocks N, Sharp DJ. Do patients who self-harm consult their general practitioner soon after hospital discharge? A cohort study. *Soc Psychiatry Psychiatr Epidemiol*. 2002 Dec;37(12):599-602.
169. Magne-Ingvar U, Ojehagen A. One-year follow-up of significant others of suicide attempters. *Soc Psychiatry Psychiatr Epidemiol*. 1999 Sep;34(9):470-6.
170. Runeson B. Parasuicides without follow-up. *Nord J Psychiatry*. 2001;55(5):319-23.
171. Kreitman N. Reflections on the management of parasuicide. *Br J Psychiatry*. 1979 Sep;135:275-7.
172. McDowell I, Newell C. *Measuring Health: A Guide to Rating Scales and Questionnaires.*: Oxford University Press; 1996.