

# Clinical decisions in psychiatry should not be based on risk assessment

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**Objective:** Risk assessments that place patients in high or low risk categories have been widely adopted by mental health services in an attempt to reduce the harms associated with psychiatric disorders. This paper examines the effects of categorization based on the results of a risk assessment.

**Methods:** The violence prediction instrument derived from the MacArthur Study of Mental Disorder and Violence was used to illustrate the nature and effects of risk assessment and the consequent categorization of patients.

**Results:** The majority of patients categorized as being at high risk will not commit any harmful acts.

**Conclusions:** Patients who are classified as high risk share the cost of efforts to reduce harm in the form of additional treatment and restrictions, although the majority will not go on to commit a harmful act. Clinical decisions made on the basis of risk assessment also divert resources away from patients classified as low risk, even though a significant proportion do go on to commit harmful act. We argue that psychiatric professionals should discuss the risks of treatment and of non-treatment with patients (or with their substitute decision-makers) and should maintain a duty to warn about the consequences of not having treatment. However, assessment of risk of harm should not form the basis for clinical decision making. We should aim to provide optimal care according to the treatment needs of each patient, regardless of the perceived risk of adverse events.

**Key words:** risk assessment, violence, suicide, mental illness.

It is widely believed that 'risk assessment' has an important role in the management of self-harm and violence. Risk assessment for future violence is common in forensic psychiatry<sup>1</sup> and risk assessment is increasingly recommended as a way of reducing both self-harm<sup>2-5</sup> and violence<sup>6-8</sup> in civil mental health settings. In NSW, mental health clinicians are routinely called on to perform risk assessments for both self-harm<sup>9</sup> and violence,<sup>10</sup> and the expectation for psychiatrists to perform some sort of risk assessment for harm to self or others is a feature of the mental health law of every Australian state and Territory. In the United Kingdom every patient is supposed to undergo a risk assessment before discharge from hospital,<sup>11</sup> and in the United States the concept of dangerousness as measured by the predicted risk of violence is a feature of laws governing civil commitment in almost every state.<sup>12</sup>

There has been an extensive and ongoing debate about the merits of clinical versus instrument-based risk assessment. However, there is an absence of evidence showing that risk assessment of any variety can reduce the harms associated with psychiatric disorder and there are strong mathematical and ethical arguments against its use.<sup>13-16</sup> Risk assessment has the understandable aim of reducing harm. However, we believe risk assessment is a

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fundamentally flawed method of harm reduction and specifically argue against using risk assessment to categorize patients as high or low risk.

## WHAT IS RISK ASSESSMENT? AN ANALOGY WITH INSURANCE

The term 'risk' has been defined as 'exposure to mischance or peril'. Risk estimations consider both the probability and the magnitude of future harm. Risk can therefore be expressed mathematically as the product of the probability of a harm occurring and the extent or magnitude of the resulting loss.<sup>17</sup>

Risk assessment originated in insurance, an industry reliant on quantifying risk.<sup>17</sup> A comparison of risk assessment in insurance and mental health illustrates the main difficulty with risk assessment in mental health. Insurance policies share risk among policy holders. Each policy holder pays a small defined cost, in the form of a premium, in exchange for a larger compensatory payout in the event of an adverse event. Insurance companies manage the sharing of risk by setting different premiums for different categories of policy holder. These categories are determined according to the calculated probability of the adverse events occurring and the magnitude of potential loss.

For example, car insurers conduct risk assessments based on the frequency of car theft and accident for different types of drivers, vehicles and areas where vehicles are kept. The companies utilize the services of actuaries to establish categories of risk dependent on the likelihood of payout (the probability of an adverse event) and the size of the anticipated payout (the cost of replacing or repairing the car). Insurance agents then sort customers into one of these established categories according to age, address, driving record and the value of the car.

In conducting their business, however, insurers make simple, reliable estimations of the probable total number of crashes or thefts within each group sharing the same risk. They do not attempt to predict and identify which individual policy-holder will make a claim, and insurance is not a way of reducing car accidents or thefts.

## WHAT IS THE PURPOSE OF RISK ASSESSMENT IN PSYCHIATRY?

In psychiatry, patients do not voluntarily enter into risk assessment and risk sharing schemes, and risk assessments are conducted in an attempt to reduce harm. The potential losses are distress, injury and, in extreme cases, death. In psychiatry, the equivalent of a premium is not a simple quantum of money, but the personal and financial cost of additional treatment experienced by the patient, including coercive treatment imposed

on 'high-risk' patients, whether or not they will actually cause or experience harm.

Mental health clinicians categorize patients; they do not predict the likelihood of harm being caused by each individual patient. While some researchers appear to believe they are using risk assessment to make risk predictions,<sup>2,6,18</sup> this is not the case.<sup>19-21</sup> When performing 'risk assessments', mental health clinicians are not like gamblers betting on the outcome of a horse race but are instead acting more like insurance agents, by sorting patients into categories determined by actuarial studies. Psychiatric clinicians conducting 'risk assessments' might feel, intuitively, that they are trying to predict whether or not the patient in front of them will come to or cause some harm, but this interpretation is wrong. The clinicians are actually categorizing patients according to the results of earlier research.

Risk categorization is different from attempting to predict behaviour. Just as insurance agents do not attempt to predict which customers will have their car stolen or smashed, so mental health clinicians are not predicting which patients will come to, or cause, harm. An accurate prediction of future violence or self-harm is impossible. By contrast, categorization is possible when the probability of a possible adverse event is calculated over an extended period of time. Categorization via risk assessment is possible, but we argue that in psychiatric practice categorization is not an effective model for reducing harm.

In mental health settings, categorization is conducted in one of two ways. Patients are usually classified as 'high', 'moderate' or 'low' risk based on the results of a clinical interview, on what is known of the patient's past history and on the clinician's opinion, informed by experience. Increasingly, clinicians are being asked to undertake 'actuarial' or instrument-based categorization, based on a score generated by a categorization tool derived from factors associated with the frequency of certain harms in a study population. These tools include the Psychopathy Checklist-Revised<sup>22</sup> and the Historical Clinical Risk Management-20<sup>23</sup> for future violence, and the SAD PERSONS scale<sup>5</sup> and the Manchester Self Harm Rule for future self-harm and suicide.<sup>4</sup> Because insurance companies do not want their agents to categorize customers on the basis of personal impressions, agents are given a series of set questions to ask. Similarly, risk assessment tools offer a transparent and standardized rating based on research rather than on the clinician's opinion. Although tool-based methods of categorization are generally more accurate than categorizations based on clinical opinions,<sup>24,25</sup> we will assume, for the purpose of this paper, that clinical categorizations are as good as tool-based categorizations. In this way, we may argue against the use of both methods as guides for clinical decisions.

In psychiatry, as in insurance, categorization involves gathering information about factors associated with future harms. The patient is then placed in a risk category that is used to guide subsequent management.

For example, being placed in a 'low-risk' category might mean that the patient is not considered 'dangerous', and hence might be less likely to be admitted to hospital or might not qualify for involuntary admission under the relevant mental health law.<sup>26,27</sup> Being placed in a 'high-risk' category could result in more restrictive care, including civil commitment, higher doses of medication and increased community supervision.

A range of harms can be considered in clinical decision making, especially the various forms of harm to self and others. In an earlier paper, we examined the properties of an imagined hypothetically excellent risk assessment instrument able to make more accurate categorizations for a wide range of harms than any existing instrument designed to predict a particular harm.<sup>28</sup> Here, we examine the known properties of the best current method for practicing violence in general psychiatry. We have used the risk-based tool developed from the MacArthur Violence Risk Assessment Study<sup>29-32</sup> to illustrate the potential consequences of categorizations in mental health settings but could have used any of the other established instruments for estimating risk of self-harm or harm to others. However, the MacArthur Violence Risk Assessment Study is supported by a substantial body of research and is perhaps the most proven risk assessment instrument devised for use in general psychiatric settings.

### APPLICATION OF THE MACARTHUR VIOLENCE RISK ASSESSMENT TO THE PREVENTION OF VIOLENCE BY ACUTELY ILL PSYCHIATRIC PATIENTS

The MacArthur Violence Risk Assessment instrument examines factors associated with violence committed by patients discharged from mental health facilities. It has been validated in an independent sample of 157 patients admitted to one of two psychiatric hospitals in Massachusetts and Pennsylvania, in a period spanning 2002 and 2003.<sup>30</sup> These patients underwent a comprehensive computer-guided risk assessment, from which a single cut-off score categorized 55 patients as high risk and 102 as low risk. The patients were then observed for 20 weeks, during which 27 patients committed an act of violence. The authors reported that 71% of patients were correctly classified as being either high or low risk and that the area under the receiver operator curve (AUC) was 0.63. This translates to a 63% chance that a randomly picked patient who went on to commit an act of violence would have a higher score than a randomly picked patient who did not commit an act of violence over the next 20 weeks. The cut-off score chosen by the researchers gave the instrument a sensitivity of 67.8% and a specificity of 72.1%. There were 19 true-positive categorizations, 36 false-positive categorizations, nine false-negative classifications and 93 true-negative classifications. We consider the consequences

of these four combinations of risk categorizations and the actual outcomes (Table 1).

### THE EFFECT OF TRUE-POSITIVE CATEGORIZATIONS

Nineteen of the 157 cases were true-positives, in that 19 of the 55 patients (34.5%) who were assessed to be at high risk of future violence actually committed an act of violence. Using the insurance analogy, this group of patients might, if risk assessment were to guide their treatment, pay a higher premium in the form of a more prolonged admission, greater supervision and increased doses of medication, but they might also benefit from additional treatment aimed at preventing future violence, assuming, of course, that such interventions were successful. In practice, such additional interventions prevent only some adverse events, because patients in hospital or on community treatment orders still attempt suicide and commit assaults.

### THE EFFECT OF FALSE-POSITIVE CATEGORIZATIONS

Thirty-six of the 157 cases were false-positives, in that 36 of the 55 patients (65.5%) who were assessed to be at high risk of future violence did not commit an act of violence. Hence, there were two false-positive high-risk categorizations for every true-positive. Following the insurance analogy, these patients pay a higher premium for being labelled 'high risk' – they are detained more restrictively, and receive additional medication and more intense supervision, but at no benefit to themselves or to the community in terms of harm averted. Moreover, the resources allocated to their care could have been directed towards the care of patients categorized as 'low risk', which category includes a number of false-negatives. High-risk categorization can result in the stigma of being labelled as violent as well as the loss of liberty and other harms associated with non-consensual care. False-positive categorized patients carry the burden of risk for all patients and, in the case of potential harms to others, they carry the burden of risk for the whole community. In insurance terms, they are paying a high premium, but will never make a claim.

**Table 1: Contingency table, of risk categorization versus future harm**

	Categorized as low-risk	Categorized as high-risk
Harm would not have occurred	True-negatives	False-positives
Harm would have occurred	False-negatives	True-positives

## THE EFFECT OF FALSE-NEGATIVE CATEGORIZATION

Nine of the 157 classifications were false-negatives, in that nine of the 102 (8.8%) patients who were assessed as 'low risk' went on to commit an act of violence. In an insurance analogy, they pay a low premium but they also miss out on treatments which might have improved their health and which could have reduced their likelihood of being violent. Australia's mental health laws do not allow non-consensual treatment of patients incapacitated by mental illness unless they are judged to present a likelihood of future harm to themselves or others. When patients are categorized as 'low risk', they are often deprived of the care they might have accepted had they been competent.

The number of false-negative categorizations could be reduced using a lower cut-off point for the high-risk group (increasing sensitivity), but this inevitably comes at the cost of more false-positives (lowered specificity).

## THE EFFECT OF TRUE-NEGATIVES CATEGORIZATION

The largest group were the true-negatives, the 93 of the 102 patients (92%) who were assessed to be 'low risk' and who were not violent in the 20 weeks of follow up. Although this group also pays a low premium in terms of less deprivation of liberty and other treatment, they derive no benefit from risk assessment. The potential harm to this group needs to be considered carefully because there is no prospect of any patient in this group benefiting from categorization. In systems where categorization is used to allocate resources or to decide on non-consensual treatment, all patients, including those who would have consented to treatment were it not for the temporary loss of insight arising from an exacerbation of their illness, are likely to have fewer resources devoted to their care because they are categorized 'low risk'. Moreover, the process of risk assessment itself consumes limited healthcare resources, further reducing clinicians' time available for actual patient care.

## APPLICATION OF THE MACARTHUR VIOLENCE RISK ASSESSMENT TO HOMICIDE BY PATIENTS WITH SCHIZOPHRENIA

It is worth considering briefly the effect of categorization on homicide by patients with schizophrenia. Highly publicized homicides by patients have precipitated the adoption of routine risk assessments before discharge in England<sup>33</sup> and Sweden<sup>34</sup> and appear to have played a role in the introduction of risk assessment in Australia.<sup>35</sup>

True and false, positive and negative, predictions can be inferred using the revised estimates of sensitivity (67.8%) and specificity (72.1%) from the MacArthur study and the 1 in 10 000 annual incidence of homicide by patients with treated schizophrenia.<sup>36</sup> These figures indicate that if every patient with schizophrenia were subject to categorization, 4117 high-risk categorizations would have to be made in order to instigate measures aimed at preventing (without a guarantee of success) one homicide; and that in every 22 421 risk assessments performed, one patient who would, in fact, go on to commit homicide would be missed. In other words, 4117 patients would have to be detained or otherwise managed for a year in a homicide-proof fashion to try to prevent just one of those patients committing a homicide, and yet one in every 22 421 patients assessed to be 'low-risk' would commit a homicide in that period.

If an even rarer event is considered – the homicide of strangers by people with schizophrenia<sup>37</sup> – the number of high-risk categorizations needed to possibly prevent one stranger homicide is of the order of 100 000.

## DISCUSSION

Health professionals are obliged to consider and discuss the risks of treatment and other options, including non-treatment, with their patients.<sup>38</sup> It is also widely assumed that they have a responsibility to inform others of specific risks posed to them by patients.<sup>39</sup> As part of the process of peer review, psychiatrists in Australia and New Zealand are required, whenever possible, to obtain a second opinion if uncertain about aspects of the patient's condition or care. Where, then, do risk assessment and categorization fit in?

Some consideration of the future harms that might be experienced by a patient and the potentially beneficial effects of treatment is undoubtedly part of a comprehensive psychiatric assessment. However, this paper suggests that risk assessment and the ensuing categorization, particularly for rare and serious harms, have little predictive value and are likely to expose patients to a range of adverse consequences, without any clear benefit for the majority of patients and to the detriment of many patients. Furthermore, if treatment or legal status is guided by perceived risk, low-risk patients will be unfairly deprived of treatment. Categorization is a poor basis for making decisions about care.

In other fields of medicine, treatment choices are guided primarily by the capacity and wishes of the patient. General medical patients are not subject to unwanted treatment for physical illnesses on the basis of risk of harm. In other fields of medicine, patients only receive treatment against their wishes if they are not capable of making an informed choice. Guardianship laws that provide a legal framework for non-consensual medical treatment rest on an assessment of mental capacity to consent or refuse consent, not on the prediction of harm to self or others. Oncologists might provide an

opinion about the potential risks and benefits of certain treatments based on the latest research, and cardiologists might examine risk factors such as smoking, hypertension and diabetes, but would only use these as a basis for discussion of treatment options with their patients.

When psychiatric patients have the capacity to make informed decisions about their care, this sort of discussion can and should occur. However, patients with more severe forms of mental illness often lack the capacity to recognize the presence of illness, to consider advice regarding the risks and benefits of treatment or to make an informed choice. Capacity can be assessed with a high degree of reliability<sup>40</sup> and we join others in arguing for the use of capacity in preference to risk as a basis for involuntary treatment.<sup>27,40–42</sup> Unlike risk assessment, capacity assessment has no element of augury.

An emphasis on a patient's decision-making capacity should relegate risk assessment to a minor place among our clinical duties. We should warn patients of the risks of treatment and of non-treatment. We should maintain duties to protect and warn anyone who is threatened and a responsibility to discuss our most difficult cases with colleagues. When judgements about risk are required by mental health legislation, we should be mindful of the severe limitations in our abilities to predict harm and the certainty that we will make both false-negative and false-positive judgements. Where patients lack capacity, we should discuss risks and benefits with substitute decision-makers, such as family, carers and the legal authorities. However, risk categorization has no useful role to play as a guide to clinical decision-making and should be abandoned.

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## DISCLOSURE

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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