

# National questionnaire survey on what influences doctors' decisions about admission to intensive care

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## Abstract

**Objectives** To determine what influences doctors' decisions about admission of patients to intensive care.

**Design** National questionnaire survey using eight clinical vignettes involving hypothetical patients.

**Setting** Switzerland.

**Participants** 402 Swiss doctors specialising in intensive care.

**Main outcome measures** Rating of factors influencing decisions on admission and response to eight hypothetical clinical scenarios.

**Results** Of 381 doctors agreeing to participate, 232 (61%) returned questionnaires. Most rated as important or very important the prognosis of the underlying disease (82%) and of the acute illness (81%) and the patients' wishes (71%). Few considered the important socioeconomic circumstances of the patient (2%), religious beliefs (3%), and emotional state (6%). In the vignettes, underlying disease (cancer versus non-cancerous disease) was not associated with admission to intensive care, but four other factors were: patients' wishes (odds ratio 3.0, 95% confidence interval 2.0 to 4.6), upbeat personality (2.9, 1.9 to 4.4), younger age (1.5, 1.1 to 2.2), and a greater number of beds available in intensive care (1.8, 1.2 to 2.5).

**Conclusions** Doctors' decisions to admit patients to intensive care are influenced by patients' wishes and ethically problematic non-medical factors such as a patient's personality or availability of beds. Patients with cancer are not discriminated against.

## Introduction

Although guidelines have been developed to help doctors decide on who to admit to intensive care, they may be difficult to put into practice.<sup>1</sup> Several characteristics of patients influence admission to intensive care, such as age and severity of illness.<sup>1-2</sup> Availability of beds has been inconsistently associated with triage decisions.<sup>2-3</sup> Cognitive factors may also influence decisions, including biases in doctors' processing of information.<sup>4-5</sup> More specifically, and regardless of prognosis, patients with cancer may have more do not resuscitate orders and receive less cardiopulmonary resuscitation, mechanical ventilation, and intensive care.<sup>6-10</sup> We assessed what influences doctors' decisions to admit patients to intensive care. In particular we sought to determine if there was a bias against patients with cancer.

## Methods

We carried out a questionnaire survey of all Swiss doctors who specialised in intensive care. We assessed the importance of potential determinants of admission to intensive care by asking respondents to rate 19 factors associated with patients or the intensive care setting and by asking them to decide on whether to admit to

intensive care eight hypothetical patients who had been admitted through the emergency department and described in eight clinical vignettes.

## Clinical vignettes

Two scenarios in the vignettes were identical for all respondents. One was designed to elicit admission to intensive care (diabetic patient with myocardial infarction) and the other refusal (acute respiratory failure warranting mechanical ventilation in a patient with relapsing leukaemia). In six vignettes potentially important features of the clinical situation were manipulated. Each scenario tested three dichotomous factors combined in a factorial design resulting in eight versions of each scenario.

The influence of cancer was assessed in all six vignettes by comparing cancer with non-cancerous disease with a similar prognosis. Two scenarios tested the influence of the patient's age and wishes, two evaluated the patient's personality and the availability of intensive care beds, one assessed the patient's financial autonomy, one assessed the patient's social commitment, and two included the family's wishes, either as an explicit request or as a non-verbal attitude.

We balanced the sets of scenarios in terms of risk factor profile. Thus each questionnaire included three vignettes with cancer and three with a non-cancerous disease; if one scenario contained the combination of

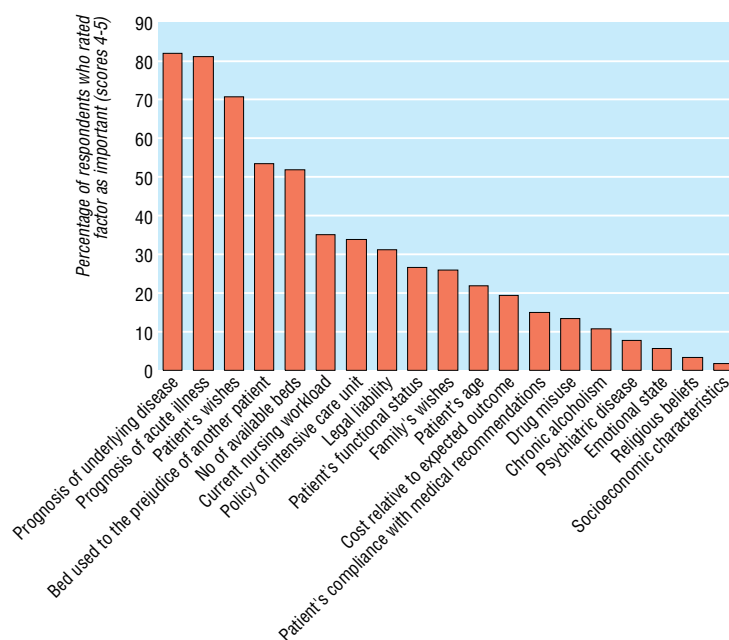
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Doctors' ranking of factors when assessing patients for admission to intensive care



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Influence of factors assessed in hypothetical scenarios on probability of being admitted to intensive care

Scenario and factors	No responding	No (%) admitted to intensive care	P value	Adjusted odds ratio (95% CI)
<b>Shortness of breath in patient with chronic obstructive pulmonary disease</b>				
Underlying disease:				
Heart failure	122	77 (63)	0.87	1.1 (0.6 to 1.9)
Colon cancer	108	67 (62)		1.0
Age:				
57 years	117	78 (67)	0.20	1.5 (0.8 to 2.6)
80 years	112	66 (59)		1.0
Patient's wishes:				
Do everything you can	122	89 (73)	0.001	2.7 (1.5 to 4.6)
No aggressive care	107	55 (51)		1.0
<b>Fever and dysuria in elderly patient with urethral obstruction</b>				
Underlying disease:				
Benign hyperplasia	117	50 (43)	0.27	0.7 (0.4 to 1.2)
Prostate cancer	112	56 (50)		1.0
Personality trait:				
Upbeat, sociable	122	70 (57)	<0.001	2.7 (1.6 to 4.7)
Sad, withdrawn	107	36 (34)		1.0
No of intensive care beds available:				
3	115	62 (54)	0.02	1.9 (1.1 to 3.3)
1	114	44 (39)		1.0
<b>Fatigue and petechiae in 42 year old woman</b>				
Underlying disease:				
AIDS	116	72 (62)	<0.001	3.0 (1.7 to 5.2)
Breast cancer	110	41 (37)		1.0
Source of income:				
Work	107	53 (50)	0.89	0.9 (0.5 to 1.7)
Social security	119	60 (50)		1.0
Family's wishes:				
Do everything you can	120	72 (60)	0.001	2.6 (1.5 to 4.6)
No aggressive care	106	41 (39)		1.0
<b>Upper gastrointestinal bleeding in patient with gastric ulcer</b>				
Underlying disease:				
Liver cirrhosis	108	69 (64)	0.51	0.8 (0.5 to 1.5)
Lung cancer	122	83 (68)		1.0
Age:				
49 years	112	82 (73)	0.026	2.1 (1.2 to 3.8)
73 years	118	70 (59)		1.0
Patient's wishes:				
Do everything you can	109	89 (82)	<0.001	4.3 (2.3 to 7.9)
No aggressive care	121	63 (52)		1.0
<b>Shortness of breath and malaise in 46 year old woman</b>				
Underlying disease:				
Systemic lupus erythematosus	112	62 (55)	0.32	1.2 (0.7 to 2.1)
Ovarian cancer	117	57 (49)		1.0
Personality trait:				
Strong, courageous	107	73 (68)	<0.001	3.5 (2.0 to 6.2)
Anxious, discouraged	122	46 (38)		1.0
No of intensive care beds available:				
3	114	67 (59)	0.04	1.7 (1.0 to 3.0)
1	115	52 (45)		1.0
<b>Nausea and vomiting in elderly patient with hypercalcaemia</b>				
Underlying disease:				
Hyperparathyroidism	109	56 (51)	0.45	0.8 (0.5 to 1.4)
Multiple myeloma	117	66 (56)		1.0
Social commitment:				
Socially active	119	73 (61)	0.02	1.9 (1.1 to 3.2)
Isolated, withdrawn	107	49 (46)		1.0
Family's attitude:				
Involved, present	107	59 (55)	0.74	1.0 (0.6 to 1.8)
Unconcerned, about to leave	119	63 (53)		1.0

cancer, younger age, and one intensive care bed, then another presented the opposite combination. Eight versions of the questionnaire were created, and each participant was randomly allocated to one of these.

## Statistical analysis

We computed means and standard deviations for continuous variables and distributions for frequency of categorical variables. The rating of factors influencing triage was dichotomised (scores 4-5 *v* 1-3).

Each scenario was analysed separately. We built a logistic regression model where the admission was the dependent variable and the three dichotomous factors the independent variables. Adjusted odds ratios for admission were obtained from these models. We then performed a pooled analysis for the factors tested in several vignettes. For factors appearing in two scenarios, such as age, we computed the McNemar matched odds ratios by cross tabulating decisions on admission for each matched pair of scenarios. The number of admissions for patients with cancer and non-cancerous disease was compared for each respondent using a Wilcoxon matched pair test.

## Results

Overall, 232 of 381 doctors (61%) returned completed questionnaires (see [bmj.com](http://bmj.com) for details of the respondents). Among the factors influencing decisions on admission to intensive care, most doctors rated as important or very important the prognosis of the acute illness and of the underlying disease and the patients' wishes (figure). Half considered availability of beds as important.

### Analysis of scenarios

One scenario (myocardial infarction) was designed to elicit an acceptance rate close to 100%; 217 respondents (94%) chose to admit the patient. In another scenario (respiratory failure in the presence of relapse with acute leukaemia) refusal was expected from most doctors yet 190 (82%) admitted the patient.

The six remaining vignettes were answered by 213 (92%) doctors. The mean number of patients admitted to intensive care was 3.3 (SD 1.3) out of six. The overall proportion of admissions across all variations of a given scenario ranged from 46% (fever, dysuria, and renal failure) to 66% (upper gastrointestinal bleeding).

Admission rates varied significantly according to at least one experimentally manipulated factor (table). Having cancer did not influence the probability of admission in five scenarios. A patient with breast cancer presenting with haemolytic uraemic syndrome was, however, three times less likely to be admitted to intensive care than a patient with AIDS with the same condition.

Certain personality traits and the patient's wish to receive maximal treatment were associated with increased odds of admission. Patients described as upbeat and sociable or strong and courageous were more likely to be admitted than patients described as sad and withdrawn or anxious and discouraged. The patient's means of living did not affect the probability of admission, but social involvement did. Younger age was associated with a slightly higher admission rate. Availability of three beds was related to a higher probability of a patient being admitted. An explicit

request from the family increased the chances of admission whereas a non-verbal emotional attachment did not.

## Discussion

Specific factors influence doctors' decisions to admit patients to intensive care. Some factors, such as consideration for the patient's wishes, agree with current recommendations. Others, such as a patient's personality, are ethically questionable. Moreover, we found a discrepancy between the acknowledged importance of some factors and the importance as shown by the hypothetical clinical scenarios, suggesting that unconscious processes may be at work, leading to biased decisions.

An important finding was the absence of discrimination against patients with cancer. Medical progress in the treatment of cancer and its complications gives the hope of improved survival and better quality of life. Thus doctors' perception of the therapeutic options for malignancies may be changing. Insufficient knowledge rather than bias would account for the difference in admission rates between the patient with AIDS presenting with haemolytic uraemic syndrome and the patient with breast cancer and the same condition.

Most doctors considered of paramount importance the prognosis of the acute illness and of the underlying disease. These two factors belong to the basic principles of triage, and studies have shown that they are associated with admission to intensive care.<sup>1-3</sup>

Patients' wishes were considered important by most respondents, and in the experimental part of the study were strongly related to admission. This sharply contrasts with the finding that the patient's personality equally influenced doctors' decisions. The preference to admit patients with a positive attitude was not conscious as respondents rated the patient's emotional state low among the determinants for admission. Similarly, a patient described as socially active was more likely to be admitted. These results raise ethical concerns.

Availability of beds was considered important and was correlated with the decision to admit. As with our study, previous studies have suggested that fewer patients are admitted when beds are scarce.<sup>2</sup> Doctors also recognised different aspects of rationing such as nursing workload and the optimal use of available beds.<sup>11</sup> Age was moderately associated with admission to intensive care.

Doctors' decisions varied according to the family's wishes and attitudes. An explicit request was related to the decision to admit to intensive care but apparent emotional attachment was not. This raises the issues of whether the patient's best interests were the doctor's prime concern in both situations and whether the doctor should actively seek the preferences of the family. Decision making in the presence of an incompetent patient is problematic. The accuracy of proxy judgments is generally poor,<sup>12</sup> but doctors' predictions of the patient's preferences are worse.<sup>13</sup> Family members can also exert pressure on the doctor,<sup>14</sup> and they often fail to fully understand their relative's state of health and related issues.<sup>15</sup>

### What is already known on this topic

Biases and practical constraints may influence doctors' decisions on admitting patients to intensive care

The relative importance of these factors is not well known

### What this study adds

Patients' wishes and ethically questionable factors such as a patient's personality or availability of beds influence doctors' decisions on admission to intensive care

Unconscious value judgments may lead to an unfair allocation of intensive care beds

The main limitation of our study is the possible discrepancy between doctors' decisions in practice and their answers to vignettes with hypothetical patients. However, the validity of the decisions is supported by the overall admission rate of about 50% and the respondents' straightforward answers. The high admission rate of the patient with relapsing leukaemia may seem surprising, but the respondents' comments about having little choice because the patient was mechanically ventilated, further indicate that their answers were based on their everyday practice. The response rate of 61% raises the possibility of non-response bias, particularly for descriptive variables such as the rating of factors influencing decisions on admission. Because response rates were similar for the eight versions of the questionnaire, a bias is unlikely in measures of association between the experimentally manipulated factors and the reported decisions.

In conclusion, doctors do not discriminate against patients with cancer when deciding on admission to intensive care. The decision making process is influenced by the patient's wishes and ethically questionable factors such as the patient's personality. The medical community must be aware of the existence of unconscious value judgments leading to possible biased decisions for admissions to intensive care.

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## Effects of reduction in heroin supply on injecting drug use: analysis of data from needle and syringe programmes

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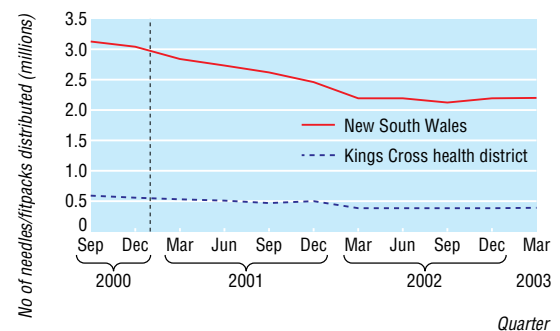
In early 2001 there was a dramatic decline in the availability of heroin in New South Wales (NSW), Australia, where previously heroin had been readily available at a low price and high purity.<sup>1</sup> The decline was confirmed by Australia's strategic early warning system, which revealed a reduction in heroin supply across Australia and a considerable increase in price,<sup>2</sup> particularly from January to April 2001.

This "heroin shortage" provided a natural experiment in which to examine the effect of substantial changes in price and availability on injecting drug use and its associated harms in Australia's largest heroin market,<sup>2</sup> a setting in which harm reduction strategies were widely used. Publicly funded needle and syringe programmes were introduced to Australia in 1987, and methadone maintenance programmes, which were established in the 1970s, were significantly expanded in 1985 and again in 1999.

### Methods and results

In NSW needle and syringe programmes are delivered primarily within the public sector through area health services. There is also a private sector programme, subsidised by the government, delivered through pharmacies (known as "fitpacks"). This enables injecting drug users to purchase or exchange needles and syringes. We used data collected by these programmes to examine the extent of injecting drug use. These data are representative of all needles and syringes distributed to injecting drug users in NSW and have been combined to produce quarterly comparable data.

The number of needles and syringes distributed in NSW decreased around the onset of the heroin shortage (figure) and the reduction was sustained until the end of the period for which data were available. The number of needles distributed decreased from around 3.1 million per quarter immediately before the heroin shortage to just under 2.2 million in mid-2002—a decrease of around 28%. Time series analysis on monthly data from major needle and syringe programmes suggested that this decline was not a seasonal effect and was tied closely to the onset of the shortage (analysis available on request).



Number of needles distributed in New South Wales, Australia, 2000-3 (data from AIDS and Infectious Diseases Branch, NSW Department of Health)

### Comment

We found a sustained reduction in the number of needles and syringes distributed in NSW after a considerable decrease in heroin supply. Given the widespread and easy availability of needles and syringes in NSW, the data on provision are a useful proxy for changes in the number of injecting drug users or in the frequency of injecting, or both. The trends observed here were also consistent with estimated reductions in the number of regular heroin users after the heroin shortage.<sup>3</sup> These data suggest an overall reduction in the prevalence of injecting drug use after a decrease in heroin supply.

We relied on secondary data sources as indirect measures of the prevalence of injecting drug use. None the less, the coherent pattern of changes outlined in this study is not easily explained by any other hypotheses and is consistent with other research on the consequences of the heroin shortage.<sup>3</sup>

Our findings are also consistent with a reduction in notifications of hepatitis C among people aged 15-19 years, which started around the time of the reduction

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