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ARTICLE

How to fairly allocate scarce medical resources? Controversial preferences of healthcare professionals with different personal characteristics

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Abstract

The scarcity of medical resources is widely recognized, and therefore priority setting is inevitable. This study examines whether Portuguese healthcare professionals (physicians vs nurses): (i) share the moral guidance proposed by ethicists and (ii) attitudes toward prioritization criteria vary among individual and professional characteristics. A sample of 254 healthcare professionals were confronted with hypothetical prioritization scenarios involving two patients distinguished by personal or health characteristics. Descriptive statistics and parametric analyses were performed to evaluate and compare the adherence of both groups of healthcare professionals regarding 10 rationing criteria: waiting time, treatment prognosis measured in life expectancy and quality of life, severity of health conditions measured in pain and immediate risk of dying, age discrimination measured in favoring the young over older and favoring the youngest over the young, merit evaluated positively or negatively, and parenthood. The findings show a slight adherence to the criteria. Waiting time and patient pain were the conditions considered fairer by respondents in contrast with the ethicists normative. Preferences for distributive justice vary by professional group and among participants with different political orientations, rationing experience, years of experience, and level of satisfaction with the NHS. Decision-makers should consider the opinion of ethicists, but also those of healthcare professionals to legitimize explicit guidelines.

Keywords: Distributional justice; distributive preferences; healthcare professional attitudes; healthcare rationing; medical scarcity; prioritizing; socialization theory

1. Introduction

The coronavirus disease 2019 (COVID-19) pandemic has shown that the role of healthcare professionals is unarguably changing and requires a broad skill-set that is increasingly diverse, including skills that traditionally have not been integrated into the medical curriculum. A sound clinical education is no longer sufficient to prepare physicians and nurses for the working environment they are facing within an underfunded public health system. Demands for healthcare have increased unprecedentedly in recent years, prompted by the aging population, improvements in technology and clinical interventions, infectious and communicable diseases, lifestyles, and general higher expectations for what medicine can do to improve health and well-being. This growth in healthcare poses a double problem: the available resources (material, financial, and human) do not keep up with this growth, and, at the same time, healthcare systems are becoming unsustainable as they consume increasing shares of countries' wealth (WHO, 2019). Over the past decade, in an attempt to reduce budget deficits, governments in developed countries started to

reduce their funding commitment to health by adopting austerity measures, increasing the scarcity of health resources. For example, the Portuguese National Health Service (NHS) approved several cost-containment measures in the wake of the Economic and Financial Adjustment Programme adopted in 2011 to reach 1% of GDP savings in medicine expenditures by the end of 2013. The NHS expenditure in 2013 was about 15% (EUR 1.3 billion) lower than in 2010, while budget transfers were reduced by 11% in the same period (European Economy, 2014). This pressure to reduce healthcare expenditures among other competing needs added a burden to the already struggling Portuguese health service. Whenever economic austerity affects healthcare funding, decision-makers are under pressure to assign relative priorities to both health services and patients, a practice that in the health economics literature is called rationing, at the macro and micro level, respectively (Klein, 1998). In Portugal, rationing at the micro level could have become explicit in the current Covid-19 pandemic if the spread of contagion had not been contained with the government's measures of compulsory confinement. Actually, the national ratio of critical care beds per 100,000 inhabitants (4.2) is the lowest in Europe (Spain, Italy, and Germany have over 9, 12, and 30 of such beds, respectively, per 100,000 inhabitants) (Rhodes *et al*., 2012).

In a context of scarcity, every decision made by policymakers, managers, administrators, and healthcare professionals are economic decisions. Therefore, economic evaluations are becoming, like it or not, an increasingly important aspect of healthcare policy making. Under the current COVID-19 pandemic, Italian and Spanish healthcare professionals, facing the collapse of their healthcare systems (e.g., an absolute scarcity of ventilators and intensive care units), were forced to select COVID patients based on their capacity to benefit from ventilators. Hard decisions were made to save as much lives as possible, even at the expense of the death of some patients. This practice was widely contested by the population, in particular by Italian relatives of coronavirus victims that are filing a series of lawsuits against the healthcare system and decision-makers, accusing the authorities of having failed them with the treatments they needed (Dettmer, 2020). There are additional reports in the media with harsh criticism against rationing based on economic criteria, regarding public funding of clinical practice (Pinho and Costa, 2020).

Ethicists have been engaged in advanced moral guidance discussions on how to justly allocate scarce medical resources (Cookson and Dolan, 2000; Daniels, 2008; Beauchamp and Childress, 2012), defining and balancing several justice principles for priority setting in clinical practice, including waiting time, efficiency, clinical and social need, age-based discrimination, and merit (see Pinho and Veiga, 2020, for a detailed description). Legitimate decisions require, however, additional information regarding what health professionals, those that are at the frontline of rationing decisions, consider being fair. Although several empirical studies (Lian, 2001; Strech *et al*., 2008; Arvidsson *et al*., 2012; Antiel *et al*., 2013; Winkelhage *et al*., 2013; Hurst *et al*., 2006, 2014; Papastavrou *et al*., 2014; Defaye *et al*., 2015; Theofanidis, 2015; Krűtli *et al*., 2016; Pinho *et al*., 2018; Pinho and Borges, 2021) explored the adherence of health professionals to these rationing criteria, the results are inconsistent and seem to be influenced by the study design, the framing of questions, and nationality of participants. Moreover, most studies do not explore healthcare professionals' attitudes regarding the main components of the rationing criteria. Nevertheless, while some criteria are well defined, others exist that because they incorporate more than one distributive dimension justify a more detailed analysis. Waiting time, merit, and social need criteria belong to the first group.

Waiting time is a criterion of distributive justice that discriminates patients based on the time spent waiting for treatment. Accordingly, the patients that waited longer should have priority. The merit criterion has a retrospective concern based on behaviors, resulting in positive or negative judgments. The appeal of positive judgments consists in promoting and rewarding social usefulness (Persad *et al*., 2009). In a healthcare context, instrumental value prioritizes those patients who's continued existence is required so that others may live. In the opposite direction, patients whose ill-health is related to their individual lifestyle choices deserve lower priority (Cappelen

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and Norheim, 2005). The social need criterion highlights an emotional dimension by taking into account the impact of patient's health on the well-being of third parties-patients' social responsibility. In our study, we evaluate health professionals' preferences for prioritizing patients who return to care for their dependent children – Parenthood.

Efficiency, age discrimination, and clinical need belong to the second group of criteria – those that may incorporate more than one distributive dimension. Allocating healthcare resources according to efficiency has the goal of maximizing healthcare benefits/outcomes, from a given budget. Health outcomes are traditionally evaluated by an index (QALY) that incorporates, simultaneously, gains in length and gains in quality of life. Thus, it would be relevant to know which of these components – life expectancy or improvements is quality of life – is more valued by health professionals. Age-discrimination (ageism) implies giving priority to younger patients over older patients for reasons of efficiency or equity (Tsuchiya *et al*., 2003). Most of the empirical studies in this field confronted attitudes toward younger patients (child, young adults, or adults) and older patients, while only a few confronted younger patients with the youngest, such as newborns (Nord *et al*., 1995; Tsuchiya *et al*., 2003), reaching nonconsensual results. To our knowledge, no prior study has explored healthcare professionals' attitudes concerning this dichotomy. Finally, prioritization of assistance and treatment according to clinical need is especially popular among clinicians. It implies that healthcare services should be allocated according to the degree of ill-health or the severity of the pre-treatment health state. Severity is, however, a multidimensional concept that draws on pain, mobility, self-care, daily activities, anxiety and depression, urgency, fairness, duty to save lives, and human dignity (Barra *et al*., 2020). Here, we use the definition of need as ill-health as proposed by Cookson and Dolan (2000). According to the authors, need as ill-health comprises both immediate threats to life and pain/suffering. Therefore it would be useful to evaluate how fair health professionals see each of these dimensions of health severity, i.e., whether healthcare professionals value more patients' pain or their risk of dying.

In the context of the present study, it is also important to acknowledge the lack of comprehensive empirical studies that explore subjective perceptions of ethical judgments. Allocating scarce medical resources involves subjective personal perceptions of justice and, therefore, should be explored with a social–psychological focus – 'justice is in the eye of the beholder' (Walster *et al*., 1976). Fairness regarding judgments of rationing principles may be influenced by a large number of factors (Törnblom, 1992), such as group identities, social relationships (Deutsch, 1975), societal context (Bauman and Skitka, 2009), and culture (Luyten *et al*., 2015). A previous study showed that participants' educational background and/or different socialization experiences appeared to affect attitudes toward distributive justice (Winkelhage and Diederich, 2012), while other studies revealed that group identities influence moral judgments and behavior (Johnson and Lord, 2010; Leavitt *et al*., 2012). In this regard, it is important to compare physicians' and nurses' perceptions of ethical problems in clinical settings, in order to reduce potential rstaff conflicts. Effective collaboration among physicians and nurses is essential to the extent that physicians and nurses work together, share responsibility for solving problems, and make decisions to formulate and execute plans for patients' care (Baggs, 2005). In recent years, there has been an increasing interest in the literature concerning the relationship between nurses and physicians and the impact of conflicts among these healthcare professionals' groups regarding the safety and quality of patients' care (Tang *et al*., 2013; Siedlecki and Hixson, 2015; Cullati *et al*., 2019, for a review). Differences between physicians' and nurses' ethical values, competing for limited resources, democratic decision-making, collective decision-making, and poor communication between the two groups of health professionals are the main conflicts identified in the literature (Kreitner and Kinicki, 2010; Aberese-Ako *et al*., 2015). These potential conflicts may become a matter of great concern in intensive care units or in rationing contexts where difficult ethical dilemmas are faced and need to be solved daily.

The major purpose of the study reported here was to: (i) explore and compare how two groups of Portuguese healthcare professionals – physicians and nurses – evaluate the fairness of 10

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rationing principles (see method section), and (ii) analyze whether participants' characteristics (sociodemographic and working experience) might account for observed variations in fairness perceptions.

2. Method

The present study follows a previously published work (Pinho and Veiga, 2020). The methodology used in this study intends to complement the previous work by deepening the analyses.

2.1 Questionnaire

This study is based on the first group of questions used elsewhere (Pinho and Veiga, 2020). The questionnaire includes 23 hypothetical rationing scenarios involving two patients distinguished by personal or health characteristics. Respondents were invited to disclose their degree of preference for giving priority to a given patient, using a 7-point semantic differential scale, with 'no preference = 0′ serving as the midpoint (−3, −2, −1, 0, 1, 2, 3). The degree of preference for one patient was rated as 'some preference' (−1 or 1),'strongly prefer' (−2 or 2), or 'definitely prefer' (−3 or 3). The choice of '0' represents the idea that respondents find it difficult to select patients only based on the presented criteria and, therefore, prefer to give an equal chance or opportunity to both candidates. A summary description of the questions can be found in Appendix A. In the final section of the questionnaire, the respondents provided information about their demographics, working background, and general opinions about the NHS. The questionnaire was preceded by an informed consent form. Confidentiality and anonymity were guaranteed.

Although we used the same questionnaire, our methodology differed from that used in Pinho and Veiga (2020) in various ways. First, we used two additional hypothetical rationing questions – instead of 21 questions we used 23 questions. These questions were added to allow the subdivision of three of the seven main rationing criteria used before (described in detail in section 2 of Pinho and Veiga, 2020). In particular, we explored the attitudes of both groups of health professionals about the main components of the following criteria: (i) health maximizing – divided into decisions concerning gains in life expectancy and benefits in quality of life; (ii) aged-based allocation – divided into decisions concerning younger patients vs older patients (ageism_old) and decisions concerning younger patients vs newborn or young children (ageism_young) and (iii) clinical need, divided into decisions concerning patients' pain or suffering and decisions concerning patients' immediate risk of death. These details help us to thoroughly understand the preference pattern around the rationing criteria of those in the frontline of each rationing context.

In sum, the questionnaire intends to explore how physicians and nurses support 10 prioritization criteria: (i) waiting time; (ii) life expectancy; (iii) quality of life; (iv) severity as pain; (v) severity as immediate risk of death; (vi) parenthood, translated as social responsibility; (vii) age discrimination against old patients (vs younger) – ageism_old; (viii) age discrimination against young patients (vs even younger patients, i.e., newborns or young children) – ageism_young; (ix) social judgments as honorable (reward) actions, i.e., social reward – positive merit, and (x) social judgments in terms of dishonorable (punishment) actions – negative merit.

2.2 Sample

The questionnaire was administered between January and May of 2016 to a sample of 254 healthcare professionals from the north and center of Portugal, working in the NHS. The healthcare professionals consisted of nurses (54.7%) and physicians (45.3%). The participants completed the questionnaire during their workday. Respondents' participation was voluntary and time

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was given to formulate reflective opinions, as suggested by Dolan *et al.* (1999). The majority of respondents (60%) were female. The sample had an average age of 42 years [SD = 10.76, age range = (22, 70)]. Most respondents (72.5%) were married, 56.9% had at least one child (17.4% less than 10 years old and 23% between 10 and 20 years old) and almost half (45%) had more than 20 years of work experience. In relation to their own experience with rationing, 40.7% had already taken some rationing measures, while only 10% had been victims of rationing themselves. One quarter of the respondents knew someone who had already been denied medical services. Finally, most respondents (51.4%) considered the NHS as working well or very well.

2.3 Data analyses

Data were analyzed using IBM SPSS Statistics 23. Criteria scores were obtained by averaging the ratings given by the participants to the indicators that described each criterion. Descriptive statistics were conducted in order to analyze normality in distribution and to examine the criteria that were most and least valued by the participants, to inspect variability in the participants' answers, and to identify undecided participants. Student's *t*-tests and one-way analyses of variance (ANOVA) followed by Gabriel's post-hoc tests for pairwise comparisons were computed to evaluate the presence of significant differences between participants' adherence to the rationing criteria based on age (younger vs older participants), gender, marital status (married or registered partnership vs single status or divorced), having children or not, children's ages (less than 15 years old and more than 15 years old), occupation (physicians vs nurses), years of working experience (less than 10 years, between 10 and 20 years, and more than 20 years), having been involved in the application of rationing or not, having been a victim of rationing or not, knowing a victim of rationing or not, political ideology (left-wing vs right-wing) and opinions concerning the NHS functioning (bad/very bad, satisfactory, and good/very good). The relation between the 10 assessed criteria for health treatment rationing were analyzed through Pearson's bivariate correlations.

3. Results

3.1 Descriptive statistics for the support of the rationing criteria

Table 1 summarizes the descriptive statistics for the 10 assessed rationing criteria and the correspondent questions, as well as the identification of undecided participants (i.e., with scores of 0 for the questions and average scores between −0.05 and 0.05 for the criteria). Details for total frequency of answers can be found in Appendix B – Table B1. Data were normally distributed, with acceptable skewness (<1.0) and kurtosis (<3.0) values for all criteria. Variability was deemed acceptable for all the criteria, as standard deviation values (SD) were close to or above 1.

The most valued criterion in rationing judgements was pain ($M = 1.52$, SD = 1.09) followed by waiting time ($M = 1.42$, SD = 1.09), while the least valued criteria were positive merit ($M = 0.22$, SD = 0.83) and ageism toward the young ($M = 0.50$, SD = 0.95). These results are related to the difficulty participants showed in judging those situations. The highest rates of undecided participants were in the scenarios involving social reward and ageism_young (72.5% and 63.2%, respectively), while the rationing situations where participants had fewer difficulties in choosing whom to treat were those involving pain and the time waiting for assistance (24.8% and 23.0%, respectively).

Participants valued more life expectancy than gains in quality of life ($M = 1.22$ and $M = 1.11$, respectively) when evaluating health benefits, with a 7.3 percentage point difference of undecided responses between both components of the health maximization criterion. In the classification of the severity of illness, the degree of pain was much more valued than the risk of death ($M = 1.52$ and $M = 0.73$, respectively), with about half the percentage of undecided participants. Patients' discrimination by age was better accepted if old patients compete with young patients, than

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Table 1. Descriptive statistics for the 10 rationing criteria

	Min	Max	Undec. (%)	*M*	SD	*Sk*	*Ku*
Ageism_old	−2.33	3.00	26.7	1.07	1.25	−0.14	−0.71
60 years vs 10 years	−3	3	35.8	1.06	1.35	−0.03	−0.74
80 years vs 40 years	−3	3	31.12	0.98	1.37	−0.32	0.01
80 years vs 20 years	−3	3	23.9	1.16	1.46	−0.31	−0.71
Ageism_young	−1.50	3.00	63.2	0.50	0.95	0.83	0.55
25 years vs 10 years	−2	3	47.7	0.83	1.25	0.52	−0.55
10 years vs new-born	−3	3	56.9	0.16	1.36	0.21	0.89
Life expectancy	−2.00	3.00	36.8	1.22	1.26	−0.06	−0.95
20% vs 40% chance	−2	3	34.9	1.13	1.31	0.13	−1.12
20% vs 80% chance	−2	3	26.6	1.28	1.34	−0.23	−0.92
Quality of life	−1.00	3.00	44.1	1.11	1.12	0.44	−1.02
Little vs modest improvement	−2	3	44.0	1.01	1.24	0.34	−1.00
Little vs substantial improvement	−1	3	38.5	1.22	1.19	0.27	−1.39
Waiting time	−1.00	3.00	23.0	1.42	1.09	−0.10	−1.08
1 month vs 6 months	−2	3	22.9	1.51	1.37	−0.46	−1.01
Today vs 1 month	−3	3	27.5	1.33	1.20	−0.28	0.004
Today vs 6 months	−2	3	26.6	1.42	1.21	−0.13	−0.96
Pain	−1.00	3.00	24.8	1.52	1.09	−0.30	−0.96
Moderate vs very painful	−2	3	13.8	1.69	1.27	−0.75	−0.31
Painless vs very painful	−1	3	25.7	1.35	1.15	−0.16	−1.06
Imminence of death	−1.50	3.00	50.4	0.73	0.98	0.43	0.24
Die in 15 vs 2 days	−3	3	53.2	0.37	1.35	−0.03	0.51
Die in 1 month vs 1 week	−1	3	42.2	1.09	1.22	0.38	−1.26
Positive merit	−2.00	2.50	72.5	0.33	0.83	0.69	1.10
Average person vs contribution to society (science)	−3	3	69.7	0.40	1.01	0.82	1.92
Average person vs social contribution	−3	3	71.6	0.25	0.85	0.60	3.49
Negative merit	−0.67	3.00	42.2	1.15	0.96	0.29	−0.97
Person with alcohol use disorder vs average person	−1	3	35.8	1.34	1.23	−0.003	−1.47
Person with substance use disorder vs average person	−1	3	36.7	1.20	1.22	0.22	−1.32
HIV patient, unsafe sex vs HIV patient, blood transfusion	−1	3	49.5	0.90	1.17	0.69	−0.85
Parenthood	−1.50	3.00	45.8	1.01	1.13	0.48	−0.89
Single, childless vs parent of three	−2	3	46.8	1.01	0.47	0.47	−0.96
Married, childless vs married, parent of three	−1	3	46.8	1.02	0.55	0.55	−1.15

Min, Minimum value; Max, Maximum value; Undec., undecided; M, Mean; SD, Standard deviation; SK, Skewness; Ku, Kurtosis.

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the choice between two young patients ($M = 1.07$ and $M = 0.5$, respectively), with the number of undecided participants to be more than double in the last case.

In sum, the prioritization criteria most valued by healthcare professionals were (by decreasing order): patients' physical pain, time spent waiting, extending life expectancy, personal responsibility for disease, improvements in quality of life, age discrimination against older patients, and parenthood. Social reward, age discrimination against younger patients, and immediate risk of life were the prioritization criteria less valued by respondents.

An observation of minimum and maximum scores shows that participants did not use the total range of scores, [−3,3], in most criteria. The most extreme case of answering bias is observed for the negative merit criterion, where respondents mostly favored patients with no personal responsibility for the illness vs patients who were ill due to their risky behavior, as observed by a minimum answer of −0.67 and a maximum of 3.00. In the opposite direction, revealing less agreement among participants, are the choices related to ageism_old (minimum and maximum scores of −2.33 and 3.00, respectively), followed by life expectancy (minimum and maximum scores of −2.00 and 3.00, respectively).

A closer look into the scores for the questions that compose each of the criteria shows that indecision and prioritization choices differ depending on the criterion presented to participants. For example, the examination of scores for ageism against the old shows that participants seem to be less undecided when the age hiatus between patients is larger (80 years vs 20 years, 23.9%) rather than smaller (80 years vs 40 years, 31.12%), and that the largest group of undecided participants is linked to rationing healthcare between 60-year-old patients and 10-year-old patients (35.8%). Although the participants always favor younger patients against older patients, this preference is higher when comparing older patients and young adults ($M = 1.16$, SD = 1.46). Choosing between two younger patients seems a much more difficult task than choosing between an older and a younger patient. Participants were very undecided when rationing healthcare between 25-year-old and 10-year-old patients (47.7%) and even more between 10-year-old patients and newborns (56.9%). However, the tendency to favor younger patients was clearer in the first question ($M = 0.83$, SD = 1.25) than in the second ($M = 0.16$, SD = 1.36). When presented with the criteria of life expectancy, participants were slightly more favorable to rationing when the discrepancy between expectancy was larger (i.e., 20% vs 80%, $M = 1.28$, SD = 1.34) rather than smaller (i.e., 20% vs 40%, $M = 1.13$, SD = 1.31). In the latter case, participants were more undecided (34.9%) compared to the former (26.6%). Such a tendency in participants' answers was consistent when presented with the criteria of quality of life improvement. Indecision was higher when the discrepancy between improvement was smaller (i.e., little vs modest improvement, 44%) than larger (i.e., little vs substantial, 38.5%), and participants' average scores showed they were more efficient in rationing when such a discrepancy was larger ($M = 1.22$, SD = 1.19). The same reasoning seemed to be applied by the participants when rationing healthcare services based on the risk of death: participants were more undecided when the time discrepancy was smaller (i.e., die in 15 days vs die in 2 days, 53.2%) rather than larger (i.e., 42.2%), with a tendency to be more efficient in applying rationing in the latter ($M = 1.09$, SD = 1.22), than in the former ($M = 0.37$, SD = 1.35). Positive merit questions resulted in higher levels of indecision compared to negative merit questions. When deciding whether healthcare should be preferentially provided to common citizens or citizens who made a positive contribution to science or to society (i.e. by rescuing refugees), participants were mostly undecided (69.7% and 71.6%, respectively). However, when reasoning about healthcare rationing based on negative merit, the application of rationing criteria was much more efficient. Such efficiency was evidenced with a smaller percentage of undecided respondents in answers regarding favoring an average person with liver failure vs a person with an alcohol use disorder (35.8% undecided, $M = 1.34$, SD = 1.23) or favoring an average person vs a person with a substance use disorder (36.7% undecided, $M = 1.20$, SD = 1.22). However, when rationing healthcare for HIV patients based on their risk behaviors, participants were once again more undecided (49.5%), resulting in

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lower efficiency when reasoning about rationing healthcare ($M = 0.90$, SD = 1.17). Finally, when asked about rationing healthcare based on parenthood, although participants favored parents of three children both when compared to single persons ($M = 1.01$, SD = 0.47) and to married childless persons ($M = 1.02$, SD = 0.55), the rates of indecision were relatively high (46.8% in both cases).

3.2 Relevance of personal participant's characteristics

Pearson's correlations showed that age was not significantly correlated with any of the distributive criteria. Student *t*-tests showed that gender, marital status, and rationing in professional practice (having had the experience vs not having this experience) did not significantly influence favoring the assessed criteria. One-way analyses of variance showed there were no significant differences between childless participants, participants with children aged 0−14, and participants with children aged 15 or older, in all the assessed criteria. However, professional occupation, having been a victim of rationing, and knowing a victim of rationing were factors that significantly distinguished the participants' answers, as shown in Table 2, which presents the results of the independent samples *t*-tests applied to the 10 criteria. The results suggest that in all criteria physicians presented a greater degree of discrimination than nurses. However, attending to statistically significant difference the results suggest that physicians value waiting time and imminence of death more than nurses. Moreover, results suggest that both having been a victim of healthcare rationing and knowing someone who has been a victim of rationing are factors that motivated respondents to attribute less importance to most of the criteria in judgement. When significant differences were identified, average scores were always lower for participants who had been victims or know victims of rationing, comparing to those who had not been victims or do not know victims of rationing.

Respondents' political orientation did not influence rationing judgements, according to the assessed criteria, except for negative merit, $t(52) = 2.08$, $p < 0.05$, where left wing participants were more supportive of this condition ($M = 1.44$, SD = 0.98), than right wing participants ($M = 0.87$, SD = 1.02).

One-way ANOVA tests were used to analyze the relevance of professional career experience levels as well as respondent's perceptions regarding the functioning of the NHS in the support for the rationing criteria. Table 3 summarizes the main results. The participants' career experience had no significant impact on the assessed criteria, except for the criterion life-threatening condition, $F(2, 106) = 3.65$, $p < 0.05$. The one-way ANOVA was followed by Gabriel's post-hoc tests, that showed that participants with less career experience (less than 10 years) valued this condition more than their more experienced colleagues (>20 years) $p < 0.05$ (no other differences were found in pairwise comparisons). Finally, in relation to participants' perceptions regarding NHS functioning, significant differences were found for ageism_old [$F(2106) = 7.58$, $p < 0.001$], ageism_young [$F(2106) = 3.61$, $p < 0.05$], gains in life expectancy [$F(2, 106) = 5.33$, $p < 0.001$] and pain [$F(2, 106) = 4.26$, $p < 0.05$]. The results of the Gabriel's post-hoc tests suggest that participants who rated the functioning of the NHS as good/very good support age discrimination, either against the old ($M = 1.49$, SD = 1.21) and the younger patients ($M = 0.61$, SD = 1.05), life extension ($M = 1.57$, SD = 1.26), and suffering in terms of pain ($M = 1.73$, SD = 1.03), more than those that rated the functioning of NHS as satisfactory or even bad/very bad.

3.3 Correlations between criteria

The correlation matrix (Table 4) indicated that intercorrelations between the criteria were mostly positive and significant. The highest observed correlations between criteria were found for ageism_old and life expectancy ($r = 0.76$, $p < 0.001$), life expectancy and parenthood ($r = 0.71$,

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Table 2. Differences between respondents' preferences by occupation, being a victim of rationing or not, and knowing a victim of healthcare rationing or not, in the criteria scores

	Occupation			Victim of rationing			Knows victim of rationing		
	Doctor M (SD)	Nurse M (SD)	t^a	Yes M (SD)	No M (SD)	t^a	Yes M (SD)	No M (SD)	t^a
Ageism_old	1.09 (1.45)	1.05 (1.12)	0.16	0.30 (0.75)	1.15 (1.26)	−3.27**	0.75 (1.06)	1.17 (1.29)	−1.52
Ageism_young	0.69 (1.26)	0.30 (0.82)	1.40	0.36 (0.71)	0.51 (0.97)	−0.48	0.48 (0.94)	0.50 (0.95)	−0.09
Life expectancy	1.53 (1.21)	1.02 (1.25)	2.05	0.36 (1.00)	1.30 (1.24)	−2.40*	0.76 (1.16)	1.35 (1.26)	−2.17*
Quality of life	1.26 (1.08)	1.05 (1.12)	0.76	0.45 (0.72)	1.19 (1.13)	−2.98**	0.76 (0.93)	1.23 (1.15)	−1.93
Waiting time	1.86 (0.97)	1.03 (1.13)	3.21**	0.61 (1.02)	1.51 (1.06)	−2.69**	0.86 (1.14)	1.61 (1.01)	−3.19**
Pain	1.65 (1.09)	1.25 (1.15)	1.46	0.86 (0.95)	1.59 (1.08)	−2.14*	0.93 (0.98)	1.71 (1.05)	−3.43**
Imminence death	1.07 (1.00)	0.42 (0.84)	2.97**	0.55 (0.88)	0.75 (1.00)	−0.65	0.59 (0.94)	0.77 (1.00)	−0.83
Positive merit	0.43 (0.77)	0.26 (0.86)	0.95	0.23 (0.61)	0.34 (0.85)	−0.41	0.24 (0.68)	0.35 (0.87)	−0.61
Negative merit	1.37 (0.96)	1.02 (0.95)	1.84	0.52 (0.69)	1.22 (0.96)	−2.34*	0.56 (0.69)	1.34 (0.96)	−3.92***
Parenthood	1.28 (1.15)	0.90 (1.14)	1.35	0.28 (0.68)	1.10 (1.14)	−2.34*	0.50 (0.87)	1.18 (1.16)	−2.82**

Student's *t*-tests.
[a]df = 107.
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Table 3. Differences between respondents preferences by career experience and satisfaction with NHS functioning in the criteria scores

	Career experience				NHS functioning			
	0–9 years *M* (SD)	10–19 years *M* (SD)	⩾ 20 years *M* (SD)	*F*[a]	Very bad/Bad *M* (SD)	Satisfactory *M* (SD)	Good/Very good M (SD)	*F*[a]
Ageism_old	1.19 (1.22)	0.79 (1.23)	1.19 (1.27)	1.19	0.61 (0.65)	0.62 (1.17)	1.49 (1.29)	7.58***
Ageism_young	0.73 (0.94)	0.47 (0.95)	0.39 (0.95)	1.13	−0.06 (0.43)	0.58 (0.89)	0.61 (1.05)	3.61*
Life expectancy	1.42 (1.33)	0.93 (1.26)	1.29 (1.20)	1.34	0.91 (0.97)	0.78 (1.23)	1.57 (1.26)	5.33**
Quality of life	1.36 (1.10)	0.84 (1.09)	1.17 (1.13)	1.80	0.91 (1.12)	1.10 (1.03)	1.19 (1.17)	0.40
Waiting time	1.72 (1.04)	1.18 (1.05)	1.44 (1.12)	1.85	0.92 (0.93)	1.44 (1.18)	1.57 (1.04)	2.33
Pain	1.46 (1.23)	1.40 (0.81)	1.63 (1.19)	0.51	0.88 (1.07)	1.49 (1.09)	1.73 (1.03)	4.26*
Imminence death	1.02 (0.90)	0.90 (0.96)	0.46 (0.99)	3.65*	0.76 (1.03)	0.54 (0.88)	0.84 (1.03)	1.02
Positive merit	0.44 (0.91)	0.32 (0.93)	0.27 (0.72)	0.38	0.35 (0.68)	0.07 (0.61)	0.48 (0.95)	2.82
Negative merit	1.38 (0.99)	0.90 (0.85)	1.19 (1.00)	1.98	1.19 (1.00)	1.12 (0.95)	1.15 (0.97)	0.04
Parenthood	0.94 (1.15)	0.87 (1.00)	1.15 (1.20)	0.71	0.68 (0.90)	0.83 (1.08)	1.23 (1.19)	2.32

[a]df = 107.
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

$p < 0.001$), life expectancy and quality of life ($r = 0.70$, $p < 0.001$), ageism_old and parenthood ($r = 0.63$, $p < 0.001$), and waiting time and pain ($r = 0.60$, $p < 0.001$).

4. Discussion

Medical resources scarcity is nowadays widely recognized, with a tendency to worsen as all publicly funded healthcare systems are confronted with budget constraints. Therefore, setting priorities among patients seems inevitable. While other countries have developed prioritization guidelines (Sabik and Lie, 2008), in Portugal priority decisions are implicit, mostly based on the preferences of healthcare professionals. Therefore, decisions about the needs that should be met by physicians and nurses involve, in the first stance, moral and ethical judgments. Because such judgments vary across cultural and organizational contexts, it is relevant to understand the Portuguese healthcare professionals distributive values and analyze if these attitudes can be related to professionals' clinical background and personal characteristics.

Our findings indicate that Portuguese healthcare professionals participating in this study when confronted with the choice between two equal patients in everything (except some health condition or personal characteristics) evaluated the fairness of the 10 criteria differently, in the following order (in decreasing order of adherence): pain, time spent in a waiting list, expectancy of life, punishment of risky behaviors leading to illness, quality of life, ageism_old, parenthood, ageism_young, and social reward. Moreover, the data suggest that rationing criteria ratings vary with the occupation of healthcare professionals (physicians vs nurses), as well as individual factors, including political orientation, having suffered from rationing measures in the past, or knowing someone who has experienced it, years of work experience, and perceptions concerning the NHS. Although, physicians presented a higher degree of discrimination among all the criteria (except ageism-old), the findings show that whenever healthcare professionals were confronted with decisions involving choices between two equal patients in everything, they rated waiting time and the risk of dying criteria fairer than nurses. The correlation matrix corroborates these preferences, by showing the positive correlation between waiting time and iminence of death, which may suggest that healthcare professionals are concerned with avoiding longer waiting times to minimize deterioration of patients' health condition.

In general, the risk of death criterion was slighly supported by respondents. A plausible explanation may be in the way the questions were asked (comparing patients that, if untreated, would die in 2 vs 15 days or die in 1 week vs 1 month), which would have led respondents to think that the unselected patients would not be treated and therefore putting both at risk of death. This reason may have some basis considering the results of Table 1 that shows high levels of undecision in these two questions (53.2% and 42.2%, respectively). Still, physicians and respondents with fewer years of experience prefered more than nurses and those with more years of experience to treat the patients that would die sooner if untreated. We believe that physicians are generally better equipped to estimate a patient's imminence in risk of death, given a particular health condition, which may explain this discrepancy between both groups of healthcare practitioners. Having a low valorization of the patient's risk of death may raise concerns since there's some empirical evidence suggesting that Portuguese lay people (Pinho and Borges, 2015) as well as the general population in other countries (Dolan *et al.*, 2005; Krűtli *et al.*, 2016; Gu *et al.*, 2015; Pinho and Borges, 2018), health professionals (Lian, 2001; Arvidsson *et al.*, 2012; Krűtli et al, 2016; Pinho and Borges, 2021) and even experts in healthcare systems (Hadian *et al.*, 2019) feel the obligation to save, in the first place, those patients in emergency and life-threatening conditions.

The adherence of healthcare professionals to the waiting list criterion contrasts with international findings, where general practitioners contested this criterion (Krűtli *et al.*, 2016) or classified it as insignificant (Hadian *et al.*, 2019). Moreover, this finding does not support ethicists'

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Table 4. Correlation matrix of the rationing criteria

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Ageism_old	–	0.29**	0.76***	0.58***	0.40***	0.55***	0.13	0.36***	0.33**	0.63***
2. Ageism_young		–	0.13	0.27**	0.33**	0.40***	0.42***	0.08	−0.08	0.34***
3. Life expectancy			–	0.70***	0.53***	0.58***	0.17	0.42***	0.47***	0.71***
4. Quality of life				–	0.57***	0.52***	0.34***	0.33**	0.45***	0.62***
5. Waiting time					–	0.60***	0.43***	0.21*	0.45***	0.50***
6. Pain						–	0.26**	0.26**	0.43***	0.54***
7. Imminence death							–	0.08	0.04	0.23*
8. Positive merit								–	0.34***	0.39***
9. Negative merit									–	0.42***
10. Parenthood										–

normative claims that waiting time (first come, first served principle) is not morally justifiable (Persad *et al.*, 2009).

Only moderate support was given toward the pursuit of efficiency, with life expectancy being slightly more favored than improvements in quality of life. This result is partly at odds, since respondents expressed so much concern about the patients' levels of physical suffering (i.e., pain) that it would be expected that they also valued gains in quality of life more than just life extension. It is worth mentioning that preferences for the life-extending criteria were positively related with those of quality of life improvements and parenthood. Earlier studies do not support our findings since prognosis was generally top-ranked as a rationing criterion (Lian, 2001; Defaye *et al.*, 2015; Hurst *et al.*, 2014; Krűtli *et al.*, 2016; Pinho and Borges, 2021). Besides, an intervention intended to prolong life when quality of life is low was one of the most frequently mentioned criteria for rationing elsewhere (Hurst *et al.*, 2006).

The support for measuring health outcomes in years of life was greater for respondents who are pleased with the NHS functioning. However, this criteria (efficiency) was not the most valued one, and thus, given the current pandemic situation and the Portuguese structural shortage of medical resources, should be seen as cautionary by decision-makers in healthcare. Therefore, it is advisable to integrate health economics topics into undergraduate and postgraduate medical education, in accordance with what has been done in other countries (Sweeney and Watts, 2009; Gray and Lorgelly, 2010; Jain, 2016). Despite the added value of health economics for healthcare personnel (Kernick, 2003; Bonča and Tajnikar, 2008; Weinberger, 2011; Walter, 2012; Fatoye, 2013; Da'ar and Al Shehri, 2015; Beecroft, 2016; Jain, 2016), in Portugal, economics is yet a deprioritized discipline in medical and nurses'training curricula. Nowadays, from the 10 existing medical universities in the country, only three (Coimbra, Lisbon, and the autonomous region of Madeira) offer the discipline of health economics, but only as an optional course. This option does not even exist in any nursing programs.

Age discrimination was only slightly valued by healthcare practitioners, who were more in agreement that younger patients should be favored comparing to older patients. This empirical finding is consistent with international evidence that shows that age should not influence prioritization although younger patients tend to be prioritized (Hurst *et al.*, 2006; Strech et al, 2008; Werntoft and Edberg, 2009). These preferences for ageism_old seem to be related with preferences for life expectancy and parenthood. It seems that participants gave priority to younger patients due to their greater capacity of gaining life years and their ability to be caregivers. Even so, participants who believed in the proper functioning of the NHS considered age discrimination of patients fairer than their colleagues who were less satisfied with the healthcare system. Discrimination among two young patients per se was very little appreciated, although there is a clear preference for attending first the younger children (e.g. newborns). Notwithstanding half of the respondents indicated that both patients deserve an equal chance at their treatment. This pattern of preferences for the very young is in line with some empirical findings (Tsuchiya *et al.*, 2003) but in contrast with others (Nord *et al.*, 1995). Our findings seem to suggest that healthcare professionals support the fair-inning ageism (Tsuchiya *et al.*, 2003), which claims that a fair distribution of healthcare resources results in every person receiving sufficient healthcare to have the opportunity to live in good health for a normal span of years (Williams, 1997).

Whether patients' harmful health behaviors should be taken into consideration in patients' prioritization is a controversial criterion. This criterion was contested by our participants even though it was ranked in the fourth place. Indeed, the healthcare professionals in this study tended to sanction those who are deemed responsible for their predicament, in an attitude that is aligned with that of lay persons (Lenton *et al.*, 2006; Wiseman, 2006; Luyten *et al.*, 2015; Pinho and Borges, 2018), but is contradicted by some theorists (Olsen *et al.*, 2003) and health experts elsewhere that judge this discrimination as incompatible with justice (Hadian *et al.*, 2019; Pinho and Borges, 2021). Moreover, the more the respondent was leaning to the political left (i.e., liberal orientation), the more likely he/she considered the negative merit to be a fair criterion to allocate

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scarce medical services. This finding is curious since it contradicts the idea that personal responsibility is more stressed by those on the right side of the political spectrum. There is evidence demonstrating that conservatives are generally healthier than liberals (Chan, 2019), and engage in healthier lifestyles (Subramanian *et al*., 2009; Kannan and Veazie, 2018; Chan, 2019; Yun *et al*., 2019). In contrast to the negative merit criteria, the reward of past usefulness or sacrifice (e.g., honourable social actions such as those impacting other peoples' health) received residual support from respondents. Thus, according to this study's respondents reciprocity is not seen as a fair allocation criterion for healthcare as some may claim (Rothstein, 2010 for a review) even though it is better accepted by physicians than by nurses. We can only speculate about this difference of opinions between both healthcare professional groups, but one possibility is that physicians feel that because they save lives they should be more entitled to healthcare. If this is correct, this finding may be in line with rational choice theory, which assumes that individuals tend to prefer the distribution mechanism that is the most advantageous for themselves.

Finally, respondents' personal experience with healthcare rationing or those reported by others seem to be a relevant predictor for attitudes toward most of the allocating criteria. This result is interesting and may be explained by the social construction of injustice, i.e., the incorporation of self and others' reports of injustice into the personal assessment of justice. Having lived and experienced the denial of healthcare was related to less support given to the rationing criteria. However, this was not as pronounced for respondents that only knew someone who had this experience. This pattern of preference seems to be in line with either the self-interest and the group-value theories of psychology of justice that predict that the personal experience of injustice will exert a much stronger effect on justice judgments than will the injustices reported by others (Lind *et al*., 1998). A possible alternative and merely speculative interpretation for these results may be that those that have already experienced healthcare rationing measures may believe that such criteria should not be applied, probably due to feelings of injustice.

The present study is not exempt from limitations that prevent the generalization of results for the attitudes of Portuguese healthcare professionals. Besides the sample limitation, the questionnaire uses hypothetical and complex scenarios involving only one distinguishing characteristic between patients, which not only does not allow to directly compare the criteria as may be unrealistic in real-life situations. Moreover, it is known that respondents tend to adopt simplifying strategies to deal with complex choices (Tversky and Kahnneman, 1981; Rabin, 1998). The format in which the questions were presented to respondents may have biased the answers. For degrees of preferences other than zero in the 7–point scale and after successive questions, respondents may perceive that choosing patient B is considered a more appropriate answer, biasing the choice in that direction. The questionnaire of this study used closed questions, forcing respondents to choose between two patients without giving them the opportunity to express the full rationale behind their decisions (which would have been useful, for example, in the interpretation of findings of questions related to risk of death, and, therefore, the evaluation of the support given to this criterion). In future research, it would be useful to use a quanti-qualitative design. Finally, the positive and negative merit criteria were explored by using only a small number of indicators. For example, for risky behaviors leading to illness, only alcohol use and substance use were presented. We are aware that using other harmful health behaviors may lead to different results. The same happens with the positive reward, where the instrumental value was not directly considered. It is our contention, however, that the contribution of this study overcomes these drawbacks.

5. Conclusion

Decisions on how to allocate scarce medical resources are embedded in moral and subjective choices about who should receive treatments and who should be excluded, which, in a limit situation, may be between who will live and who will be left to die. Such painful decisions may,

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sooner or later, have to be made, as shown in the midst of the current public health crisis we are experiencing.

Since healthcare rationing decisions involve subjective perceptions, it is important and urgent to define explicit guidelines to help those in the frontlines to deal with prioritization dilemmas. The legitimacy of these guidelines requires that healthcare professionals, the gatekeepers of healthcare resources, share the values inherent in the distributive criteria proposed by ethicists. Our results show that Portuguese healthcare professionals respondents revealed moderate support for the rationing criteria proposed in the literature. From all the rationing criteria, the findings suggest that whenever healthcare professionals were confronted with decisions involving the choice between patients equal in everything except their degree of suffering and the waiting time, they prioritize based on these criteria. The findings of the current study also suggest that the acceptance probability for the criteria is, to different extents, related to the type of healthcare practitioner (physician or nurse), political orientation, years of experience, to have had the experience of being denied healthcare (or to know someone who had such an experience), and the level of satisfaction with the NHS. Even so, we found that physicians have broadly similar views as nurses, in that they mainly support the patients' physical suffering and waiting time. However, we found some evidence that nurses may give less priority to patients with longer waiting times and those in life-threatened conditions. This potential tension between healthcare professional groups regarding the value of their judgments concerning healthcare rationing merits further investigation, in order to aid the prevention of interprofessional tensions and to inform healthcare policymakers in the process of developing guidance on appropriate principles for healthcare rationing.

Finally, our study demonstrates that there is no single recipe for the way in which prioritization decisions should be made, and that this is a matter that deserves to be analyzed in broader samples and across different professional cultures and countries, given the relevance of healthcare professionals' characteristics involved in the decisions.

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/S1744133121000190.

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References

Aberese-Ako M, Agyepong I, Gerrits T and Dijk H (2015) I used to fight with them but now I have stopped!': conflict and doctor-nurse-anaesthetists' motivation in maternal and neonatal care provision in a specialist referral hospital. *PLoS ONE* **10**, e0135129.

Antiel R, Curlin F, James K and Tilburt J (2013) The moral psychology of rationing among physicians: the role of harm and fairness intuitions in physician objections to cost-effectiveness and cost-containment. *Philosophy, Ethics, and Humanities in Medicine* **8**, 13.

Arvidsson E, André M, Borgquist L, Andersson D and Carlsson P (2012) Setting priorities in primary health care – on whose conditions? A questionnaire study. *BMC Family Practice* **13**, 114.

Baggs J (2005) Overview and summary: partnerships and collaboration: what skills are needed? *The Online Journal of Issues in Nursing* **10**, 1, Overview and Summary.

Barra M, Broqvist M, Gustavsson E, Henriksson M, Juth N, Sandman L and Solberg C (2020) Severity as a priority setting criterion: setting a challenging research agenda. *Health Care Analysis* **28**, 25–44.

Bauman C and Skitka L (2009) Moral disagreement and procedural justice: moral mandates as constraints to voice effects. *Australian Journal of Psychology* **61**, 40–49.

Beauchamp T and Childress J (2012) *Principles of Biomedical Ethics*. New York: Oxford University Press.

Beecroft C (2016) Why health economics deserves a place in the medical curriculum. *Journal of Comparative Effectiveness Research* **5**, 321–323.

Bonča P and Tajnikar M (2008) Value added of health economics for health personnel. *Medicinski Glasnik* **5**, 65–72.

Cappelen A and Norheim O (2005) Responsibility in healthcare: a liberal egalitarian approach. *Journal of Medical Ethics* **31**, 476–480.

Chan E (2019) Political orientation and physical health: the role of personal responsibility. *Personality and Individual Differences* **141**, 117–122.

Cookson R and Dolan P (2000) Principles of justice in health care rationing. *Journal Medical Ethics* **26**, 323–329.

Cullati S, Bochatay N, Maître F, Laroche T, Muller-Judge V, Blondon K, Perron N, Bajwa N, Vu N, Kim S, Savoldelli G, Hudelson P, Chopard P and Nendaz M (2019) When team conflicts threaten quality of care: a study of health care professionals' experiences and perceptions. *Mayo Clinic Proceedings: Innovation, Quality & Outcomes* **3**, 43–51.

Da'ar O and Al Shehri A (2015) Towards integration of health economics into medical education and clinical practice in Saudi Arabia. *Medical Teacher* **37**(Suppl. 1S), 56–60.

Daniels N (2008) *Just Health: Meeting Health Needs Fairly*. New York: Cambridge University Press.

Defaye F, Desalegn D, Danis M, Hurst S, Berhane Y, Norheim O and Miljeteig I (2015) A survey of Ethiopian physicians' experiences of bedside rationing: extensive resource scarcity,tough decisions and adverse consequences. *BMC Health Services Research* **15**, 467.

Dettmer J (2020) Italians Demand Compensation for Coronavirus Deaths. Available at https://www.voanews.com/covid-19-pandemic/italians-demand-compensation-coronavirus-deaths [29 June 2020]

Deutsch M (1975) Equity, equality, and need: what determines which value will be used as the basis of distributive justice? *Journal of Social Issues* **31**, 137–149.

Dolan P, Cookson R and Ferguson B (1999) Effect of discussion and deliberation on the public's views of priority setting inhealth care: focus group study. *British Medical Journal* **318**, 916–919.

Dolan P, Shaw R, Tsuchiya A and Williams A (2005) QALY Maximization and people's preferences: a methodological review of the literature. *Health Economics* **14**, 197–208.

European Economy (2014) The Economic Adjustment Programme for Portugal 2011-2014. Occasional Papers 202. European Commission Directorate-General for Economic and Financial Affairs. Available at http://ec.europa.eu/economy_finance/publications/. [10 June 2020]

Fatoye F (2013) Editorial: understanding of health economics among healthcare professionals. *Journal of Clinical Nursing* **22**, 2979–2980.

Gray E and Lorgelly P (2010) Health economics education in undergraduate medical degrees: an assessment of curricula content and student knowledge. *Medical Teacher* **32**, 392–399.

Gu Y, Lancsar E, Ghijben P, Butler J and Donaldson C (2015) Attributes and weights in health care priority setting: a systematic review of what counts and to what extent. *Social Science & Medicine* **146**, 41–52.

Hadian M, Jouyani Y, Asadi H, Palangi H and Rahimnia R (2019) Identifying the criteria affecting appropriate allocation of health system resources to different diseases in Iran: a qualitative inquiry. *Health Scope* **8**, e83968.

Hurst S, Slowther A, Forde R, Pegoraro R, Reither-Theil S, Perrier A, Garrett-Mayer E and Danis M (2006) Prevalence and determinants of physician bedside rationing: data from Europe. *Journal of General Internal Medicine* **21**, 1138–1143.

Hurst S, Forde R, Slowther A and Danis M (2014) The interaction of bedside rationing and the fairness of healthcare systems: Physicians views. In Danis M, Hurst S, Fleck L, Ford R and Slowther R (eds), *Fair Resource Allocation and Rationing at the Bedside*, Part. **one**. Oxford: Oxford University Press.

Jain V (2016) Time to take health economics seriously—medical education in the United Kingdom. *Perspectives on Medical Education* **5**, 45–47.

Johnson R and Lord R (2010) Implicit effects of justice on self-identity. *Journal of Applied Psychology* **95**, 681.

Kannan V and Veazie P (2018) Political orientation, political environment, and health behaviors in the United States. *Preventive Medicine* **114**, 95–101.

Kernick D (2003) Introduction to health economics for the medical practitioner. *Postgraduate Medical Journal* **79**, 147–150.

Klein R (1998) Managing scarcity: priority setting and rationing in the national health service. *BMJ* **314**, 313.

Kreitner R and Kinicki A (2010) *Organizational Behavior*, 9th Edn. New York, NY: McGraw-Hill.

Krűtli P, Rosemann T, Tőrnblom K and Smieszek T (2016) How to fairly allocate scarce medical resources: ethical argumentation under scrutiny by health professionals and Lay. *PLoS ONE* **11**, e0159086.

Leavitt K, Reynolds S, Barnes C, Schilpzand P and Hannah S (2012) Different hats, different obligations: plural occupational identities and situated moral judgments. *Academy of Management Journal* **55**, 1316–1333.

Lenton A, Blair I and Hastie R (2006) The influence of social categories and patient responsibility on health care allocation decisions: bias or fairness? *Basic and Applied Social Psychology* **28**, 27–36.

Lian O (2001) Norms for priority setting among health professionals: a view from Norway. *Sociology of Health & Illness* **23**, 357–385.

Lind E, Kray L and Thompson L (1998) The social construction of injustice: fairness judgments in response to own and others' unfair treatment by authorities. *Organizational Behavior and Human Decision Processes* **75**, 1–22.

Luyten J, Kessels R, Goos P and Beutels P (2015) Public preferences for prioritizing preventive and curative health care interventions: a discrete choice experiment. *Value in Health* **18**, 224–233.

Nord E, Richardson J, Street A, Kuhse H and Singer P (1995) Maximizing health benefits vs egalitarianism: an Australian survey of health issues. *Social Science and Medicine* **41**, 1429–1437.

Olsen J, Richardson J, Dolan P and Menzel P (2003) The moral relevance of personal characteristics in setting health care priorities. *Social Science & Medicine* **57**, 1163–1172.

Papastavrou E, Andreou P and Efstathiou G (2014) Rationing of nursing care and nurse–patient outcomes: a systematic review of quantitative studies. *International Journal of Health Planning and Management* **29**, 3–25.

Persad G, Wertheimer A and Emanuel E (2009) Principles for allocation of scarce medical interventions. *Lancet* **329**, 224–227.

Pinho M and Borges A (2015) Bedside healthcare rationing dilemmas: a survey from Portugal. *International Journal of Human Rights in Healthcare* **8**, 233–246.

Pinho M and Borges A (2018) A three-country survey of public attitudes towards the use of rationing criteria to set healthcare priorities between patients. *International Journal of Ethics and systems* **34**, 472–492.

Pinho M and Borges A (2021) Healthcare professional's attitudes concerning prioritization decisions: a quali-quantitative analysis in Angola. *Global Business and Economic Review* **24**(2), 128–146.

Pinho M and Costa E (2020) Can mass media be an obstacle to rationing decisions? A case report from Portugal. *International Journal of Health Governance* **25**, 3–11.

Pinho M and Veiga P (2020) Attitudes of health professionals concerning bedside rationing criteria: a survey from Portugal. *Health Economics, Policy and Law* **15**, 113–127.

Pinho M, Borges A and Cookson R (2018) Do healthcare professionals have different views about healthcare rationing than college students? A mixed methods study in Portugal. *Public Health Ethics* **11**, 90–102.

Rabin M (1998) Psychology and economics. *Journal of Economic Literature* **36**, 11–46.

Rhodes A, Ferdinande P, Flaatten H, Guidet B, Metnitz P and Moreno R (2012) The variability of critical care bed numbers in Europe. *Intensive Care Medicine* **38**, 1647–1653.

Rothstein M (2010) Should health care providers get treatment priority in an influenza pandemic? *The Journal of Law, Medicine and Ethics* **38**, 412–419.

Sabik L and Lie R (2008) Priority setting in health care: lessons from the experiences of eight countries. *International Journal for Equity in Health* **7**, 4.

Siedlecki S and Hixson S (2015) Relationships between nurses and physicians matter. *The Online Journal of Issues in Nursing* **20**, 6.

Strech D, Synofzik M and Marckmann G (2008) How physicians allocate scarce resources at the bedside: a systematic review of qualitative studies. *Journal of Medicine and Philosophy* **33**, 80–99.

Subramanian S, Huijts T and Perkins J (2009) Association between political ideology and health in Europe. Short report. *European Journal of Public Health* **19**, 455–457.

Sweeney R and Watts J (2009) Is there Value in Including Health Economics in an Undergraduate Medical Curriculum? Available at http://ihea2009.abstractbook.org/presentation/621/ [25 August 2020]

Tang C, Chan S, Zhou W and Liaw S (2013) Collaboration between hospital physicians and nurses: an integrated literature review. *International Nursing Review* **60**, 291–302.

Theofanidis D (2015) A qualitative study on discrimination and ethical implications in stroke care in contemporary Greece. *Journal of Vacular Nursing* **33**(4), 138–142.

Törnblom K (1992) The social psychology of distributive justice. In Scherer KR (ed.), *Justice: Interdisciplinary Perspectives*. Cambridge: University Press, pp. 177–236

Tsuchiya A, Dolan P and Shaw R (2003) Measuring peoples' preferences regarding ageism in health: some methodological issues and some fresh evidence. *Social Science and Medicine* **57**, 687–696.

Tversky A and Kahnneman D (1981) The framing of decisions and the psychology of choice. *Science* **211**, 453–458.

Walster E, Berscheid E and Walster G (1976) New directions in equity research. *Advances in Experimental Social Psychology* **9**, 1–42.

Walter U (2012) Teaching health economics health care system and public health at German medical faculties. *Gesundheitsw* **74**, 435–441.

Weinberger S (2011) Providing high-value, cost-conscious care: a critical seventh general competency for physicians. *Annals of Internal Medicine* **155**, 386–388.

Werntoft E and Edberg AK (2009) The views of physicians and politicians concerning age-related prioritisation in healthcare. *Journal of Health Organization and Management* **23**(1), 38–52.

WHO (2019) Countries are spending more on health, but people are still paying too much out of their own pockets. Available at https://www.who.int/news-room/detail/20-02-2019-countries-are-spending-more-on-health-but-people-are-still-paying-too-much-out-of-their-own-pockets [5 June 2020]

Williams A (1997) Intergenerational equity: an exploration of the 'fair innings' argument. *Health Economics* **6**, 117–132.

Winkelhage J and Diederich A (2012) The relevance of personal characteristic in allocating health care resources – controversial preferences of laypersons with different educational backgrounds. *International Journal of Environmental Research and Public Health* **9**, 223–243.

Winkelhage J, Schreier M and Diederich A (2013) Priority setting in health care: attitudes of physicians and patients. *Health* **5**, 712–719.

Wiseman D (2006) Medical resource allocation as a function of selected patient characteristics. *Journal of Applied Social Psychology* **36**, 683–689.

Yun L, Vanderloo L, Berry T, Latimer-Cheung A, O'Reilly N, Rhodes R, Spence J, Tremblay M and Faulkner G (2019) Political orientation and public attributions for the causes and solutions of physical inactivity in Canada: implications for policy support. *Frontiers in Public Health* **7**, 153.

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