Physician Perceptions of Catching COVID-19: Insights from a Global Survey

INTRODUCTION

Despite more than 50 million cases of COVID-19 worldwide, the number of infected physicians is not fully known. While efforts are underway to chart the actual infection risk among physicians,[1, 2] it is equally important to understand perceived risk which influences behavior. Risk perception is a subjective process in which people use heuristics (shortcuts) to evaluate information.[3] Such heuristics are influenced by many factors including personal experiences and beliefs—one reason why people see the same risk differently. This process is subject to cognitive biases—for example, people often overestimate risks that are beyond their control and underestimate risks that they undertake willingly.[3–5]

METHODS

This is an analysis of an anonymous, cross-sectional, random, stratified survey, conducted from September 9 to 15, 2020, of verified physicians registered with Sermo, a digital platform for medical crowdsourcing. The survey results were de-linked to respondent's personal identifiable information to create de-identified data. This analysis was deemed exempt research by the Duke University Medical Center institutional review board. Following online informed consent, this survey aimed to sample 1000 doctors equally divided between the USA, Europe (EU), and the rest of the world (RoW) on many topics of which one question pertained to perceived risk. The self-risk question was "What is your likelihood of catching COVID-19 in the next three months?" The physicians were asked to give their best estimate as an exact percentage. Data were analyzed with JMP Pro15 and Protobi.

RESULTS

The survey was completed by 1004 physicians (40 countries, 67 specialties, 49% frontline [e.g., ER, infectious disease, internal medicine]) with a mean (SD) age of 49.14 (12) years. Mean (SD) self-risk estimate was 32.3% ± 26% with a range from 0 to 100% (Fig. 1). Risk estimates were higher in younger (< 50 years) doctors and in non-US doctors versus their older and US counterparts ($p < 0.05$ for all) (Fig. 2). Risk estimates were higher among frontline versus non-frontline doctors ($p < 0.05$). Risk estimates were higher for women than for men ($p < 0.05$) among respondents (60%) reporting gender.

DISCUSSION

The average 3-month risk perception estimate of 32%, if true, would mean that one-third of all physicians worldwide would have been infected by December 2020. This is higher than the SARS-CoV-2 seroprevalence mean rate of 8.7% (CI 6.7–10.9%) reported in meta-analyses of 49 studies of 127,480 healthcare workers.[1–3] Our survey also finds a high variability of risk perception (0–100%). Some of the variance may be logical (e.g., higher risk estimate in front line workers and lower risk estimate in low prevalence areas). But the greater than 20-fold variation in risk perception among the entire sample is unlikely to be purely rational. For example, the lower risk estimate of male physicians in our survey is consistent with prior literature showing males tend to judge a wide range of hazards as lower risk compared with women and that these differences are in part due to sociopolitical factors.[5] The lower risk perception found in our survey in the USA (versus Europe and Asia) contrasts with the higher health worker seroprevalence rate found in North America (versus Europe and Asia).[1]

Measuring and calibrating risk perception correctly are important since there are consequences to both overestimation and underestimation.[3–5] Overestimation of risk can lead to greater compliance with safety regulations but also anxiety[6]
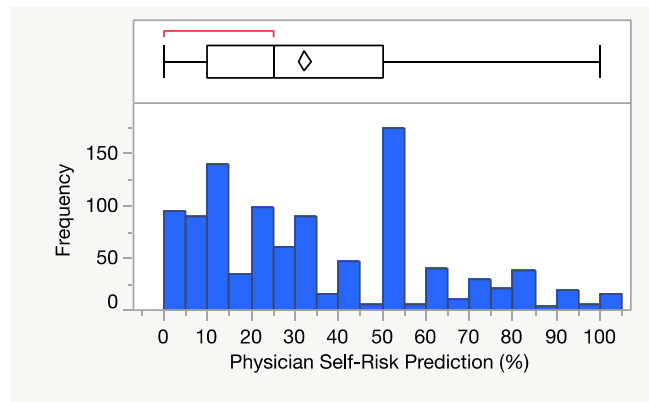
Figure 1 Distribution of risk prediction for overall sample ($N = 1004$). Upper panel is a line box whisker plot showing the median, mean, quartiles, and range. The bottom panel shows the frequency distribution.

and avoidance of necessary activities (e.g., routine physical exams). Underestimation can raise a physician's risk for catching COVID-19 and/or becoming super-spreaders. Physician risk perceptions may also influence how they educate patients and formulate public health safety policies.

Study limitations include cross-sectional design, convenience sample, lack of data on actual behavior and infection rates, inability to control for possible contributors to heuristics (such as socio-cultural and political beliefs, personal medical

history, living situations, personal beliefs), and the fact that perceived and actual risk are interactive. There currently is no specific formula with a list of plug-in parameters to calculate true objective risk for COVID-19. This survey provides comparative insights into how the global health worker community may perceive infection risk. In summary, we call for carefully designed research to determine how perceived risk influences the actual risk of catching COVID-19 in order to develop better risk stratification and protection.
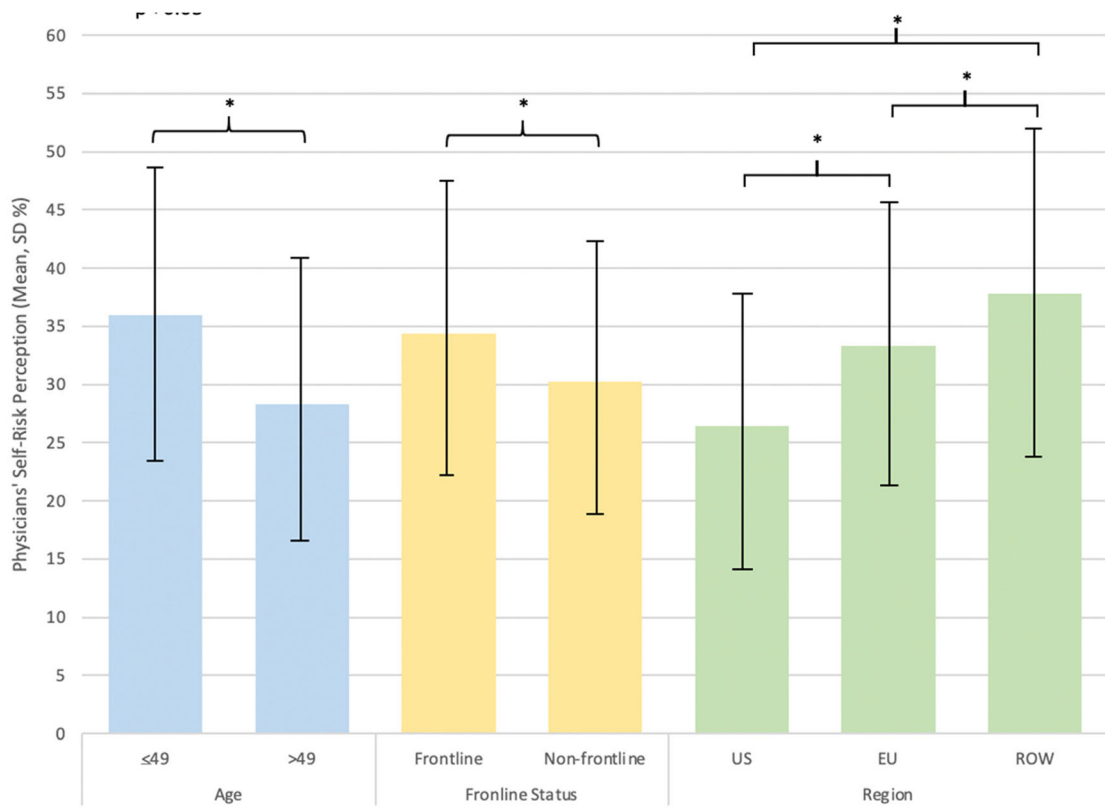

Figure 2 Physician self-risk estimate (mean, SD) by strata of age, frontline status, and geographic region. *$p < 0.05$.

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Data Availability: The datasets can be made available from the corresponding author on reasonable request.

Declarations:

Conflict of Interest: PMD has received research grants from and/or served as an advisor or board member to government agencies, technology and healthcare businesses, and advocacy groups for other projects, and owns shares in companies whose products are not discussed here. MMC reported personal fees outside the submitted work. DA is a co-founder of Shapa, a start-up that designed numberless scale. ARL has no conflicts of interest to report. Detailed author disclosures are provided separately.

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