Corruption should be taken into account when considering COVID-19 vaccine allocation

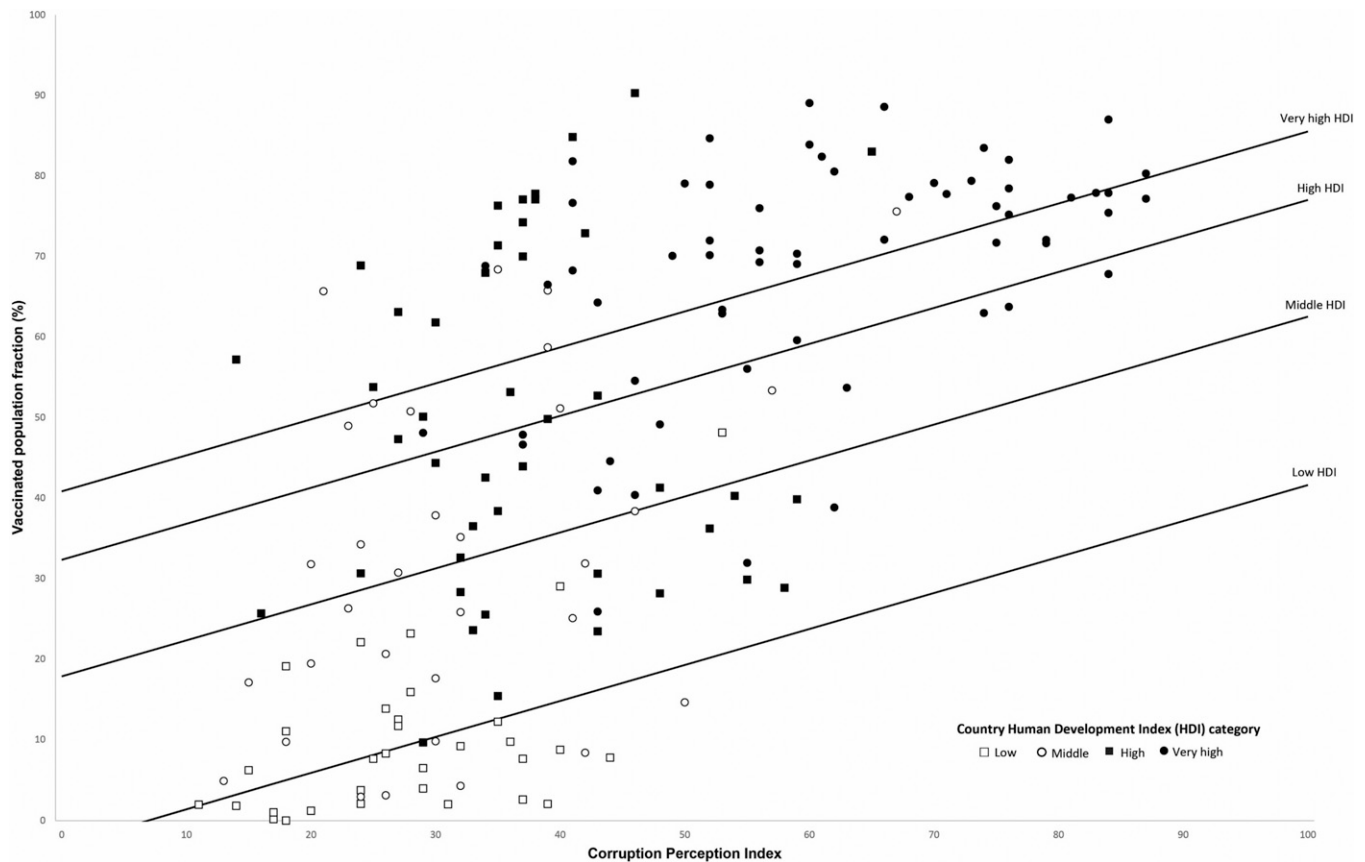Armin Spreco[a], Thomas Schön[b], and Toomas Timpka[a,1] 🔟

Fig. 1. Country-level associations between the population proportion having received at least one dose of COVID-19 vaccine and corruption measured by the CPI displayed by HDI categories. Regression lines for countries in the low, middle, high, and very high HDI categories are shown. Country-level data on the VPF were collected on 14 December 2021 and on CPI and HDI on 21 October 2021. From a total of 223 listed countries, 169 countries were included in a linear regression analysis, where each country was regarded as an independent observation. The excluded countries comprised those with missing data on any of three variables ($n = 51$) or having introduced compulsory vaccination for all adults ($n = 3$).

Twelve months after vaccines against COVID-19 were made available, the number of vaccinated was still at an unsatisfactory level, even in world regions with highly developed biotechnical industries (1). Duch et al. (2) argue that how to allocate scarce COVID-19 vaccines is one of the most important decisions governments around the world have recently faced. From a study involving 13 countries, they reported a consistent population preference for a government-only mode of allocation. However, they also observed that large groups in low- and middle-income countries were willing to purchase vaccine on the private market in order to receive it faster. The authors infer that any private access would complement public provision to maximize the vaccination benefits and minimize the potential for corruption (3).

However, they did not include corruption in their analysis model. Systemic corruption is the use of power for private gain and the deliberate betrayal of public trust (4). To quantify the influence from illicit use of power on COVID-19 vaccination coverage, we investigated country-level associations between vaccination coverage and level of corruption. The vaccinated population fraction (VPF) (1)

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and the corruption perception index (CPI) (5) were analyzed for all countries with available data using linear regression adjusting for gross national income per capita, educational level, and life span through the human development index (HDI) (1).

Only 29% (33 of 113) of the countries with CPI below 50 had a VPI higher than 50% (Fig. 1). The VPF was associated with CPI across all HDI categories. We, therefore, chose an analysis model without interaction variables. Explaining 66% of the variance in VPF ($R^2 = 0.66$), the model displayed a strong association between VPF and CPI while adjusting for HDI; a 1% unit growth in CPI increased the VPF by 0.45% units (95% CI = 0.26 to 0.64% units; $P < 0.001$) keeping HDI fixed.

We made no attempts to investigate the mechanisms by which corruption influences COVID-19 vaccination coverage. These mechanisms are likely to differ between countries in different HDI categories. Corrupt behaviors, such as stockpiling by unauthorized agents (6), may have influenced variations in VPF more in countries in the lower HDI categories, while public perception of government and state corruption (7) may have contributed to vaccination resistance in countries with ample vaccine availability. Demographic differences between countries were covered only by the life span data included in the HDI. Moreover, vaccination was compulsory in some countries for selected groups, which may have influenced the VPF.

Our analysis showed a robust country-level association between COVID-19 vaccination coverage and corruption level when adjusting for the HDI. The analysis did not account for differences in the distribution of COVID-19 vaccines from manufacturers to nations on financial or political grounds. Therefore, the results cannot be used in argumentation about the global distribution of vaccines. We infer that corruption needs to be highlighted in national-level vaccine allocation processes and anticorruption interventions (8) need to be adopted if satisfactory COVID-19 vaccination coverage is to be attained. We recommend that corruption is included in the analysis model when preferences for vaccine allocation in the general population are studied.

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