Table 1. Sources of databases information including source, nation, updated time, and owner

Data source	Nation	Updated time	Owner
Characteristics of HCP with COVID-19 [1]	US	July 16th, 2020	U.S. CDC
COVID-19 transmission dynamics data [2]	Taiwan	Apr 2nd, 2020	Taiwan CDC
California COVID-19 Health Surveys [3]	US	Sep 31st, 2020	California COVID-19 Health Center
Texas Health Center COVID-19 Survey [4]	US	Oct 7th, 2020	Texas Health Center
O*Net database [5]	US	Nov 16th, 2020	U.S. Department of Labor
COVID-NET database [6]	US	Aug 28th, 2020	U.S. CDC
Texas COVID-19 Data [7]	US	Apr 29th, 2021	Texas Department of State Health Services
Cross-sectional observational study of UK-based HCP [8]	UK	May 25th, 2020	The authors

Table 2. Characteristics of the selected features and their associated databases

Features		Values/Units	Notation	Characteristics	Data sources
Time from symptom onset to hospitalization		Days	SOH_{time}	Secondary clinical attack rate is significantly high within the first 5 days from symptom onset	COVID-19 transmission dynamics data in Taiwan
Clinical severity of patients		Discrete	CS	Be classified into: Asymptomatic, Mild illness, Mild pneumonia, Severe pneumonia, and ARDS/sepsis	
PPE sufficiency level		%	PPE_{SL}	To assess the sufficiency level, we used the answer of nurses and physicians to the question: "Does your hospital have adequate PPE for clinicians to treat the patients you have right now?". In addition, Texas Health Center COVID-19 Survey Summary Report provided the Health Centers with an adequate supply of (PPE) for the next week.	1. California COVID-19 Health Surveys: Data and Charts 2. Texas Health Center COVID-19 Survey Summary Report
Contact with others		Score from 0 to 1	CO	The four physical job attributes help to determine the occupational-specific risk score: • **Contact with others**: How much does this job require the worker to be in contact with others to perform it? • **Physical proximity**: To what extent does this job require the worker to perform tasks in close physical proximity to others? • **Exposure to disease/infection**: How often does this job require exposure to disease or infection? • **Working hours per week**	U.S. Department of Labor O*Net database
Physical proximity			PP		
Exposure to disease/infection			EI		
Working hours per week			N_{hours}		
Patient characteristics	Age	Continuous	Age	Age of HCP	Cross-sectional observational study of UK-based healthcare workers
	Having Cancer	Binary	$Cancer$	HCP's comorbidities include cancer	
	Having respiratory disease	Binary	$Resp$	HCP's comorbidities include respiratory disease	
	Having obesity	Binary	$Obes$	HCP's comorbidities include obesity	
	Current or Ex-smoker within 1 year	Binary	$Smoker$	HCP is a current smoker or ex-smoker within one year	

Work details	Allied health professionals	Binary	$Allied\_prof$	HCP is a current smoker or ex-smoker within one year
	Dentists and dental staffs	Binary	$Dental\_staff$	HCP is a dentist or a dental staff
	Doctors	Binary	$Doctor$	HCP is a doctor
	Use public transport	Binary	Pub_trans	HCP uses public transport to travel to work
Workplace exposure	Regular clinical contact	Discrete	$C\_contact$	Having Regular clinical contact with suspected or confirmed COVID-19 patients
	Regular exposure to AGPs	Discrete	AGP	Having Regular exposure to aerosol generating procedures (AGPs) performed in suspected or confirmed COVID-19 patients
PPE usage	Sufficient training in PPE use	Binary	PPE_train	Having Sufficient training in PPE use before handling patients
	Lacked access to PPE	Binary	$Lacked\_PPE$	Lacked access to PPE items for clinical contact with suspected or confirmed COVID-19 patients
	Clinical contact without adequate PPE	Discrete	$Cont\_wo\_PPE$	Be classified into never, rarely, sometimes, often, always
	Used improvised PPE	Binary	Imp_PPE	HCP has used improvised (customized) PPE

References

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3. *California Health Care Foundation, California COVID-19 Health Surveys: Data and Charts*. April 1, 2020; Available from: https://www.chcf.org/project/california-covid-19-health-surveys/#physician-survey.
4. *Health Resources & Services Adminstration, Texas Health Center COVID-19 Survey Summary Report*. Oct 7th, 2020; Available from: https://bphc.hrsa.gov/emergency-response/coronavirus-health-center-data/tx.
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