Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Results: The dataset consisted of 45,360 patients. The cohort was 22% Black, 35% Hispanic, 37% White, and 6% Other. The mortality was 15% for all groups. White patients had the highest mortality rate at 17% compared to 10% in Blacks, 14% in Hispanics, and 15% in Other (ANOVA, $p<0.0001$). Whites were significantly older (Wilcoxon rank sum, <0.0001) with a median age of 71 years (IQR 59-80), compared to Blacks with a median age of 60 (IQR 46-71), Hispanics with a median age of 57 (IQR 44-70), and other races with a median age of 61 (IQR 48-73). Race was statistically significant in a multivariable model including age, sex, and race, with women having an odds ratio of 1.35 for survival. 6484 patients required ICU admission and intubation with hemodynamic support. This burden was disproportionate across racial groups, with 15.6% of Blacks and 13.9% of non-Blacks having such critical disease ($P<0.0001$, z-test for proportions). The overall median hospital length of stay (HLOS) for all races was 5 days (IQR 3-11). The median HLOS for all non-Whites was 5 days, whereas for Whites it was 6 days ($p<0.0001$). Whites were significantly less likely to be discharged home ($P<0.001$). A significantly higher proportion of Blacks and Hispanics were on Medicaid compared to Whites ($p<0.0001$).

Conclusion: White patients had a higher mortality rate than non-White patients hospitalized for COVID-19; however, Black and other non-White patients were hospitalized for COVID-19 at a younger age than White patients. Black patients were significantly more likely to require admission to the ICU. These data suggest there is a multifactorial etiology behind the varying impact of COVID-19 on patients. Further examination of other social determinants of health are warranted to fully understand COVID-19 health disparities.

3 MyCOVIDrisk: User Experience Study Of COVID-19 Risk Assessment and Mitigation Application

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Background: MyCOVIDRisk app is a free, publicly available COVID-19 risk estimation and mitigation tool. The MyCOVIDRisk app has since been accessed almost 1.3 million times since launch, demonstrating the acceptability of a free and simple web-based mobile application to estimate risk of COVID-19 transmission. Little is known about how mobile apps influence assessments of risk. User experience ("UX") studies are a key strategy for examining usability and influence of digital technology.

Study Objectives: Our primary objectives were to (1) describe how the app informs interpretation of COVID-19 risk, (2) describe motivations for use and patterns of use, (3) to inform future app design.

Methods: This UX study consisted of two parts. Part 1 focused on new users' experiences, particularly navigation of the user interface across various operating systems and devices. Part 2 focused on repeat users' experiences, particularly how they interpreted risk, what motivated their use of the app, and whether it modified behavior. Participants were recruited remotely via social media advertisements on Facebook, Instagram, and Twitter. To reach existing users, Part 2 additionally included emailing MyCOVIDRisk users who previously sent unsolicited feedback on the app. Study participants were entered into raffles to win one of two $50 Amazon gift codes. For Part 1, users completed a series of tasks during a semi-structured 30-minute video interview using the app while sharing first impressions, likes, and dislikes. Live notes taken tracked common user errors, points of confusion, and other insights. Part 2 consisted of 40-minute semi-structured video interviews with repeat users. Participants shared their personal pandemic experiences, related health decisionmaking processes, and their experience with the MyCOVIDRisk app. Interviews were audio recorded, transcribed, and analyzed to find common themes and subthemes.

Results: Recruitment continued until thematic saturation was reached. Part 1 and Part 2 included 8 and 5 unique participants, respectively. Participants varied in terms of background (age range: 21-73 years), geography, prior use of the app, and goals of usage. Key use cases were as a teaching tool, source of authority and objectivity, and resource for personal decisionmaking (Fig 1). Nearly all pointed to simplicity and ease of use as key design strengths. Repeat users highlighted the interactive nature and ability to change parameters, eg, "when it [MyCOVIDRisk App] came out, I used it you know like a hundred times-like what if I do this or what if I do that? Like almost like a video game!" Challenges included difficulty in estimating number of people present and percent that would be masked, and desire for more complex activities than the prepopulated options. Users nearly unanimously suggested integration of vaccine status as an input parameter. Other common recommendations included more customization options (eg, ability to change font size), having more information when hovering over icons, and options to send inputs and risk score results to others or to print them for documentation.

Conclusion: This UX testing of a COVID-19 risk assessment and mitigation app confirmed key principles for design: clear imagery, interactivity, and interpretable science. Future work should incorporate new data in real-time and improve customizability.

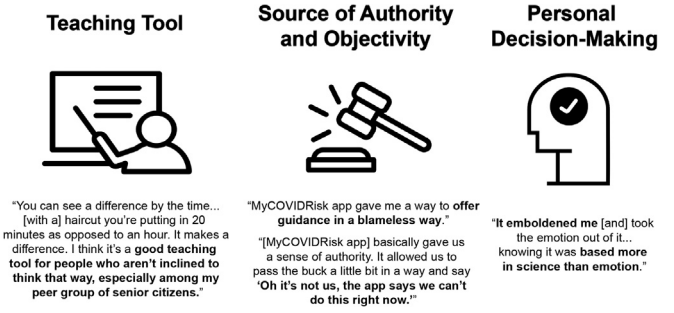

Figure 1. Primary cases for MyCOVIDRisk app based on interview responses from repeat users.

4 Association of the Initial Clinical Characteristics With the Need for the Intensive Care Unit And Hospitalization in Patients Presenting to the Emergency Department With Acute Symptomatic COVID-19

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Study Objective: Acute infection with COVID-19 is associated with a wide variety of symptoms and a range of clinical severity from benign to life-threatening. Certain ED presenting symptoms may be associated with either a severe or a benign outcome. The objective of this study was to evaluate the association of initial clinical symptoms with need for hospitalization, intensive care or death in ED patients within 30 days after presenting with acute symptomatic COVID-19.

Methods: This study is a retrospective case-series of patients presenting to a single ED with acute symptomatic COVID-19 from March 7–August 9, 2020. Symptomatic patients with laboratory-confirmed SARS-CoV-2 infection were eligible for this study. Patients who tested positively for COVID-19 due to screening tests but had no reasonably associated symptoms were excluded. Structured chart review was performed, and participants were analyzed by three categories representative of clinical severity: intensive care unit (ICU) care/death, general ward admission, and ED discharge /convalescence at home. Outcomes were ascertained 30 days after initial presentation to account for escalation in severity after the ED visit. We conducted univariate and multivariable logistic regression analyses to report odds ratios and adjusted odds ratios (aOR) with 95% confidence intervals (95% CI) between hospital or ICU care/death versus convalescence at home and between ICU care/death versus general ward admission. Multivariable models were developed using stepwise selection in logistic regression.

Results: In total, 994 patients were included in the study, of which, 551 (55.4%) patients convalesced at home, 314 (31.6%) patients required general ward admission, and 129 (13.0%) required ICU care or died. In the adjusted models, ED patients requiring hospital admission were more likely to be aged $\geq$ 65 years (aOR 7.4, 95% CI: 5.0, 10.8), Black/African American (aOR 3.0, 95% CI: 1.6, 5.8) or Asian/American Indian/Alaska Native/Other (aOR 2.2, 95% CI: 1.1, 4.3), and experience dyspnea (aOR 2.7, 95% CI: 2.0, 3.7) or diarrhea (aOR 1.6, 95% CI: 1.1, 2.2). However, they were less likely to experience sore throat (aOR 0.4, 95% CI: 0.2, 0.6), myalgia (aOR 0.5, 95% CI: 0.4, 0.7), headache (aOR 0.5, 95% CI: 0.4, 0.8), or olfactory/taste disturbance (aOR 0.5, 95% CI: 0.3, 0.8). ED patients who

required ICU care or died were more likely to experience altered mental status (aOR 3.8, 95% CI: 2.1, 6.6), but were less likely to report history of fever (0.5, 95% CI: 0.3, 0.8).

Conclusions: In ED patients with acute COVID-19, complaints of sore throat, myalgias, headache or smell/taste disturbances were associated with discharge and convalescence at home. Patients who were ≥ age 65, Black/African American, experiencing dyspnea, diarrhea, or altered mental status were more likely to undergo hospital admission. Among all admitted patients, altered mental status was positively associated with ICU care or death, and a history of fever was negatively associated with ICU care or death. COVID-19 presents with a heterogeneous constellation of symptoms, and an understanding of the association of the presenting symptoms with the ultimate patient outcome may be useful for allocating resources and targeting management plans.

Table 1. Association of Initial Clinical Symptoms with Clinical Severity of ED Patients Presenting with COVID-19

Logistic Regression Models for Hospital Admission vs. Convalescence at Home				
	OR (95% CI)	*p*-value	aOR (95% CI)†	*p*-value
Age group				
< 65 years	1.0 [Referent]		1.0 [Referent]	
≥ 65 years	9.0 [6.3, 12.7]	<0.0001	7.4 [5.0, 10.8]	<0.0001
Race				
Black/African American	2.9 [1.7, 4.8]	<0.0001	3.0 [1.6, 5.8]	0.0007
White	1.0 [Referent]		1.0 [Referent]	
Asian/American Indian/Alaska Native/Other	1.5 [0.9, 2.5]	0.1633	2.2 [1.1, 4.3]	0.0251
Sore throat				
Yes	0.3 [0.2, 0.5]	<0.0001	0.4 [0.2, 0.6]	0.0006
No	1.0 [Referent]		1.0 [Referent]	
Shortness of breath/Dyspnea				
Yes	2.6 [2.0, 3.4]	<0.0001	2.7 [2.0, 3.7]	<0.0001
No	1.0 [Referent]		1.0 [Referent]	
Muscle aches/Myalgia				
Yes	0.4 [0.3, 0.5]	<0.0001	0.5 [0.4, 0.7]	0.0002
No	1.0 [Referent]		1.0 [Referent]	
Headache				
Yes	0.3 [0.2, 0.4]	<0.0001	0.5 [0.4, 0.8]	0.0018
No	1.0 [Referent]		1.0 [Referent]	
Diarrhea				
Yes	1.4 [1.1, 1.9]	0.0257	1.6 [1.1, 2.2]	0.0113
No	1.0 [Referent]		1.0 [Referent]	
Olfactory/ Taste disturbance				
Yes	0.3 [0.2, 0.5]	<0.0001	0.5 [0.3, 0.8]	0.0070
No	1.0 [Referent]		1.0 [Referent]	
Logistic Regression Models for ICU Care/Death vs. General Ward Admission				
	OR (95% CI)	*p*-value	aOR (95% CI)‡	*p*-value
History of fever				
Yes	0.6 [0.4, 0.9]	0.0073	0.5 [0.3, 0.8]	0.0067
No	1.0 [Referent]		1.0 [Referent]	
Altered mental status/Confusion				
Yes	3.5 [2.2, 5.7]	<0.0001	3.8 [2.1, 6.6]	<0.0001
No	1.0 [Referent]		1.0 [Referent]	

† Adjusted for age, race, sore throat, shortness of breath/dyspnea, muscle aches/myalgia, headache, diarrhea, olfactory taste disturbance, using stepwise selection in logistic regression.
‡ Adjusted for history of fever and altered mental status/confusion, using stepwise selection in logistic regression.
ED, emergency department; OR, unadjusted odds ratio; aOR, adjusted odds ratio; CI, confidence interval; ICU, intensive care unit.

5 It's Time to Rethink How We Screen for Communicable Diseases in the Emergency Department: Lessons Learned From COVID-19

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Study Objectives: COVID-19 symptom severity varies between patients, and some remain asymptomatic. During early April 2020, 70% of patients admitted to the emergency department (ED) of a major hospital in New England had COVID-19, many of whom required treatment in the intensive care unit. As the volume of COVID-19 cases presenting to the ED increased, it became essential to develop accurate triage protocols to separate COVID-positive from COVID-negative patients. This study assessed which of three different clinical screening tools – a nursing triage screen (NTS), an ED clinician Review of Systems (ROS), and a standardized ED attending physician COVID-19 probability assessment – was best at identifying patients who had COVID-19 (based on subsequent PCR confirmation).

Methods: All 748 patients admitted from the ED between April 27, 2020, and May 17, 2020 were included. Sensitivity, specificity, and positive and negative predictive values were calculated for each screening tool. Logistic regression was used to assess each tool's performance. A principal components analysis (PCA) was performed; the resulting factors were used to model COVID-19 positivity.

Results: The emergency physician's probability assessment yielded higher sensitivity (0.62, 95% confidence interval [CI] 0.53-0.71, Table 1) than the NTS (0.46, 95% CI 0.37-0.56), and had higher specificity (0.76, 95% CI 0.72-0.80) than the NTS (0.71, 95% CI 0.66-0.75) and the emergency clinician ROS (0.62, 95% CI 0.58-0.67). Categorization as moderate or high probability on the emergency physician's probability assessment was also associated with the highest odds of having COVID-19 in regression analyses (adjusted odds ratio=4.61, 95% CI 3.01-7.06). Moderate agreement (kappa 0.41-0.60) was observed between the NTS and ED clinician ROS for fever, cough, shortness of breath, and diarrhea; fair agreement (kappa 0.21-0.40) for sore throat, headache, abdominal pain, and vomiting; and poor agreement (kappa 0.00-0.20) for myalgias and chills. The 323 patients who had a response recorded for every symptom were included in the PCA. Only Factor 1 (fever, chills, fatigue, sore throat, rhinorrhea, and cough) was associated with increased odds of testing positive for COVID-19.

Conclusion: While the emergency physician's probability assessment had higher sensitivity and specificity than the other two tools, none of the tools evaluated in this study was sufficiently accurate enough to replace a COVID-19 PCR test on a patient entering a clinical setting where transmission control is crucial. These findings suggest that hospitals not rely on symptom or probability assessment in determining infection status but continue to utilize widespread testing. We recommend that providers in other countries experiencing COVID-19 surges consider the relevance of these findings and that as the pandemic develops (with the potential for continued new variant strains), diagnostic testing efforts should supersede the use of clinical screening tools.

Table 1. Comparison of performance of three different ED screening tools

	Nursing Triage Screen	ED Provider Review of Systems	Attending Physician Probability Assessment
Sensitivity	0.46 (0.37-0.56)	0.53 (0.43-0.62)	0.62 (0.53-0.71)
Specificity	0.71 (0.66-0.75)	0.62 (0.58-0.67)	0.76 (0.72-0.80)
Positive Predictive Value	0.29 (0.23-0.36)	0.26 (0.21-0.33)	0.40 (0.33-0.47)
Negative Predictive Value	0.84 (0.80-0.87)	0.84 (0.79-0.88)	0.89 (0.85-0.92)

6 Health Care Worker Psychological and Physiological Health During the COVID-19 Pandemic

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Study Objective: Previous work has established that frontline health care workers (HCWs), such as emergency physicians and nurses, are vulnerable to the development of adverse behavioral, psychological, and physical sequelae, which may persist long after the disaster. We examine the prevalence and predictors of psychological distress in ED clinicians working during the COVID-19 pandemic. We examined psychological and physiological (sleep, resting heart rate, blood pressure) of a sample of frontline providers during the COVID-19 pandemic

Methods: This was a sample of 52 clinicians (physicians, residents, nurses, PAs, NPs) who were frontline HCWs during the COVID-19 pandemic across a diverse (academic, community, urban, and suburban) range of four emergency departments in the New York Metropolitan area during July 2020-September 2020. Study design is a