

Lockdown! Learning public health of infectious diseases through gameplay

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ABSTRACT The COVID-19 pandemic has demonstrated the detrimental effects of a lack of understanding of public health measures. During the pandemic, lockdowns, social distancing, and mask mandates introduced by governments were met with skepticism, doubt, and an unwillingness to comply, increasing the extent of negative outcomes as a result. Albeit devastating, the pandemic has offered an invaluable opportunity to observe the correlation between the prevalence of public health education and compliance with public health measures during critical times. In this article, we describe a card game that was developed during the COVID-19 pandemic to educate the public (including children) about how specific public health measures address the pandemic and how global cooperation is essential in addressing even one country's problems. The game can be used in primary, secondary, or tertiary education classrooms, initiating conversations about the topic and providing a basic understanding before more in-depth learning.

KEYWORDS COVID-19, SARS-CoV2, lockdown, public health, pandemic, airborne transmission, virus, card game, gameplay, education

As COVID-19 has shown us, a lack of public understanding can be damaging to policies aiming to combat public health crises. It increases distrust and noncompliance, putting whole populations at risk. However, long-lasting compliance with extreme measures such as lockdowns or social distancing can impact psychological well-being and lead to social disconnection when the population has not fully grasped the reasons behind these measures and how the disease spreads. The topic of public health measures can also be difficult to introduce in class because of pre-conceived ideas and social tensions. We hypothesized that this could be mitigated by a card game containing educational information, especially when played under the supervision of someone knowledgeable on the topic. It is possible to use the game in a variety of educational contexts. In primary or secondary school classes, the game helps the teacher introduce basic concepts of public health and information about respiratory infectious diseases. With undergraduate classes, it provides a way for the instructor to engage the students on a topic that can be studied in more detail. University students in fields related to infectious diseases (nursing, medicine, microbiology, public health, etc.) can play an important role in understanding the rationale behind (unpopular) policies and, therefore, need to be encouraged to help people around them to make sense of scientific facts and public health measures/restrictions. This card game provides students the opportunity to reflect more deeply about public health policies and can help some of them become more engaged informal influencers.

PROCEDURE

Lockdown! an educational card game, was developed during the COVID-19 pandemic to explain restrictions to children of school age (6–12 years old; e.g., why they could

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Although we provide a free version of *Lockdown!* in Supplementary Materials (Appendix 1), *Lockdown!* is also sold commercially (<https://www.capitalgainsgroup.com/product-page/lockdown-an-educational-card-game>), although not-for-profit (all profits go to an international children's charity, The Red Pencil, <https://redpencil.org>).

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FIG 1 *Lockdown!* game card deck. The game can be played by 2–6 players, individually or in pairs, lasting 15–20 min. It introduces basic concepts on infectious respiratory disease symptoms, disease transmission, and public health measures to limit their spread.

not meet with friends/grandparents). Its use was later extended to the public and older students, up to the university level. In this game, players adopt the role of governments and aim to save the most infected patients. To do so, they need to solve pandemic-related issues by playing corresponding, mild, or more radical public health measures: e.g., they can solve “Imported cases” with the cards “Travelers’ quarantine” or “Travel ban” (Fig. 1). While the former is a one-time solution, the latter costs more cards but

safeguards the player against “Imported cases” for the rest of the game. If a player is unable to resolve a particular issue, they can use the infected patients accumulating in their hand to claim the “International collaboration” card that obliges opponents (other governments) to help. The game takes 15–20 minutes and is played in pairs or individually, with 2–6 players. The illustrations make it playable without reading/English skills and teach about disease symptoms. Thus, *Lockdown!* is also suited for heterogeneous groups, e.g., families with children of different ages and/or non-English-speaking members.

The game can be purchased commercially (non-profit). A printable version of the game is also provided as Supplementary Material (Appendix 1). A two-sided color printer is required to print the game, either regular letter-sized paper that is later laminated or cardboard is recommended for use in gameplay (regular paper can be used but will not be as durable). In the classroom, it is recommended to be played in groups of 4–6 students (two or three teams of two) and is, therefore, more practical for in-class play with small class sizes (<40 students) and out-of-class play with larger numbers of students. The instructor and an assistant (if available) familiar with the rules briefly explain the game to the class before breaking them up into smaller groups. They should be available during play to answer questions from students. We suggest bringing the class back together for a debrief and discussion after a few games are played by the smaller groups (1).

Lockdown! was tested informally with small (15–40) students of primary, secondary, and undergraduate university classes (Public Health and Microbiology introductory courses). Students of all ages and at all education levels understood the concepts rapidly. For primary and secondary school students, high levels of game engagement were observed as well as receptiveness to discuss public health measures when prompted afterward. For undergraduate students, the game was used to open lectures on the One Health approach in public health as well as on respiratory infectious diseases. It was effective as an icebreaker between freshmen. The lecturer observed that the students were subsequently more engaged than usual with the lecture material. A study is in preparation to quantify the game's impact on learning across age groups.

CONCLUSION

Since its release in 2021, the game has received positive reviews in scientific evaluation of COVID-19 related games (2, 3) from a national newspaper in Singapore (4) as well as from the public, such as online customers, YouTubers, and primary/secondary school and undergraduate students. Games such as *Lockdown!* can educate a wide range of populations: e.g., while more knowledgeable players may spontaneously recognize gameplay mechanics reflecting complex concepts, children may relate to illustrations. Moderators likely play an important role in directing players' focus to the higher-level concepts (1), and educational interventions based on the card game should be formalized and compared. Furthermore, longitudinal studies need to test whether *Lockdown!* will remain relevant in the post-COVID era. We believe that it will, as its concepts apply to most respiratory infectious diseases and bring people together, helping them process their past struggles and increasing their preparedness for new public health disasters.

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ADDITIONAL FILES

The following material is available [online](#).

Supplemental Material

Appendix 1 - Printable Lockdown! Game (jmbe00095-23-S0001.pdf). Printable version of the card game.

Appendix 2 - Printable Lockdown! Rulebook (jmbe00095-23-S0002.pdf). Printable version of the game's rulebook.

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