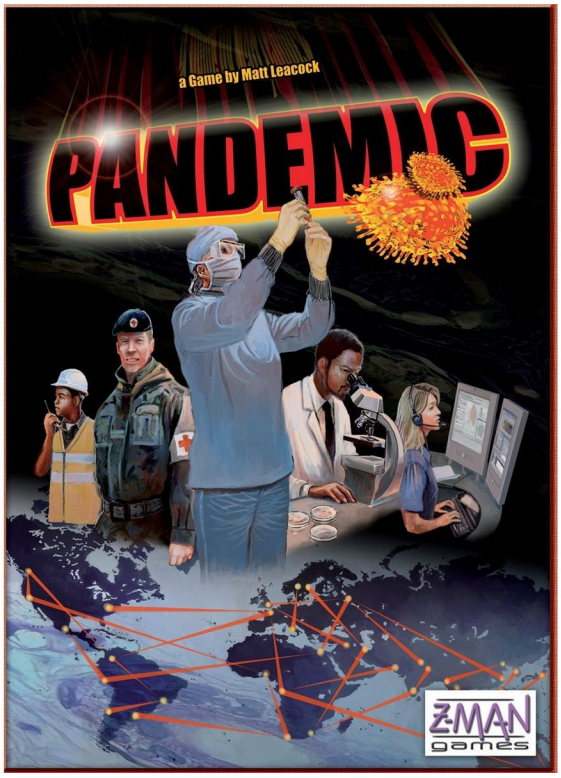
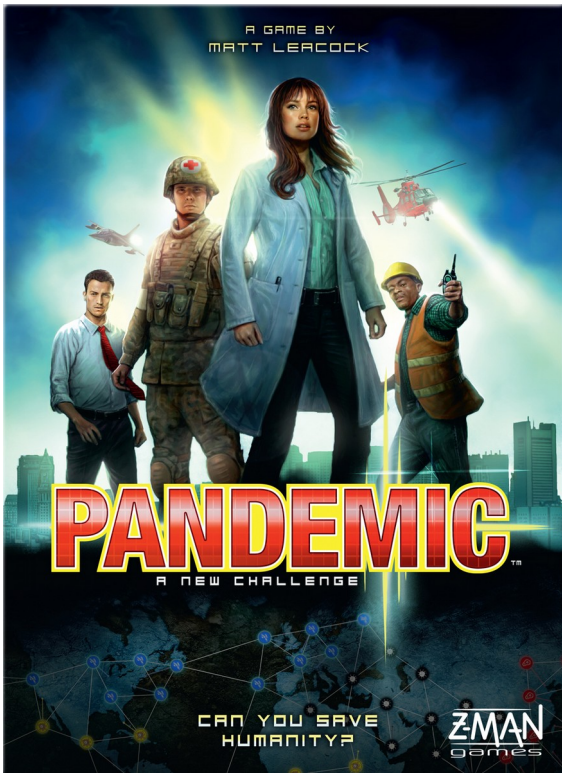
Pandemic as an Educational Tool

Overview:

Pandemic by Z-man Games (not to be confused with an electronic game with the same name) is a great board game for simulating epidemics. Students can use this data sheet to keep track of infections and other events in the game. The game itself is a great simulation, but the information gained through playing a few games can be illuminating when it is graphed.





The game has been released in two editions, though both are virtually identical in gameplay. The greatest change between editions is the artwork. Ideally, one copy of the game is needed for every 4 students.

Teaching How to Play:

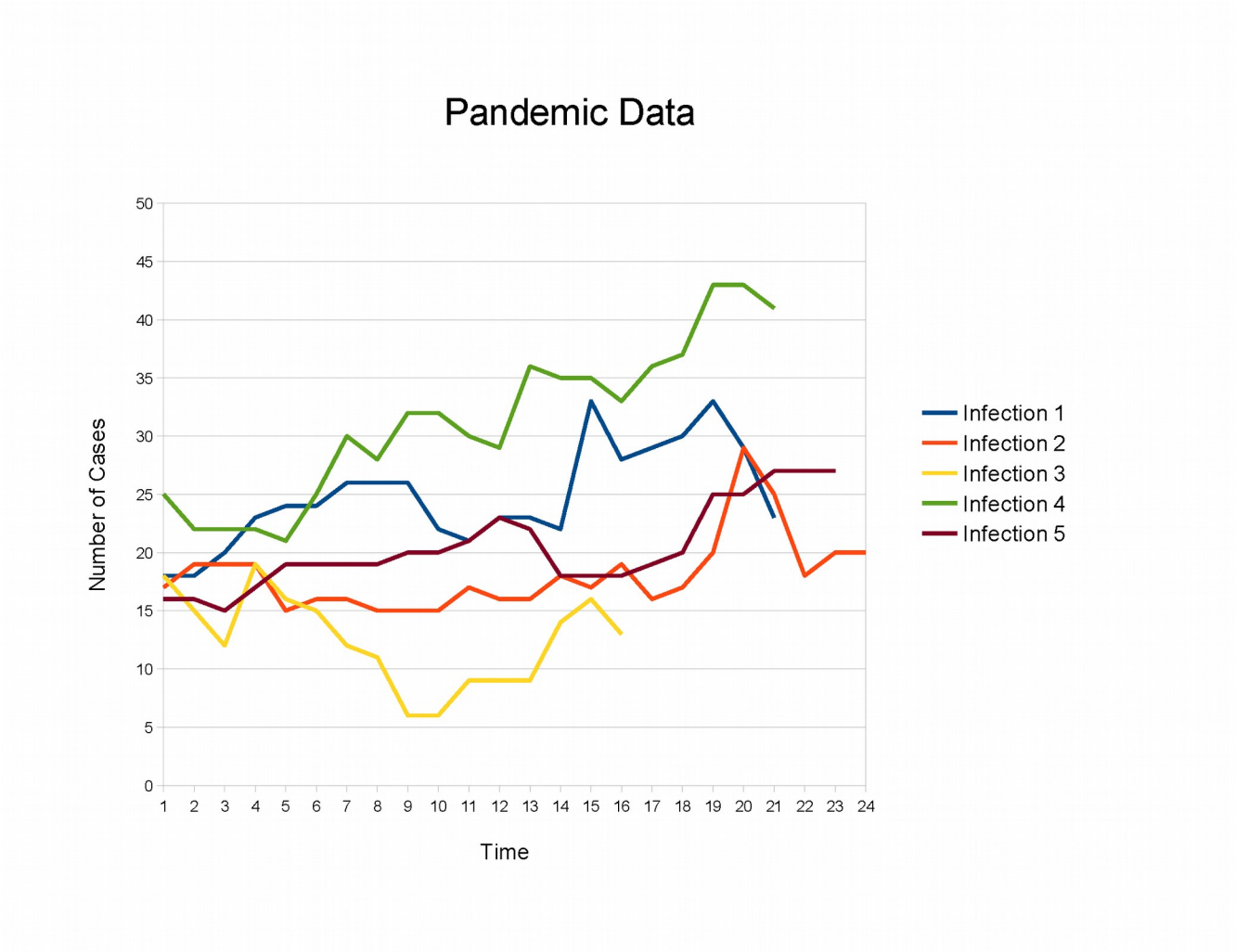
When I taught a small number of students (8 or fewer), I demonstrated gameplay by playing a round as a class. Students paired up to play each role, which worked well because Pandemic is a cooperative game. A conceptual description of the game appears in the essay on page 3.

When I teach larger numbers of students, I demonstrate gameplay by showing a video and then helping groups as they play their first game. There are two YouTube videos linked below. I show an edited version of the TableTop episode because the original is long and includes some dialogue I would not permit in my classroom.

- Online Video Tutorial Series: Pandemic
  This is a short, 10 minute video produced by the publisher. It is an okay introduction, but very dry and I do not think it would hold students attention.
- Pandemic: Morgan Webb, Ed Brubaker, and Robert Gifford Join Wil on TableTop*
  This is a longer, much more entertaining video. Of course, it includes some less-than-ideal dialogue that would be too entertaining in my classroom, so I use an edited version. The original episode is 25 minutes in length, and the edited one clocks in at 18 minutes. *Contact me if you would like a copy of my edited version.

Integrating Gameplay into Instruction

I believe there is a lot of instructional value to the game, though if the teacher does not address it, much of what could be learned is lost. Many of these elements are explained more in-depth in the essay on the next page, but key factors include challenges of outbreaks / disease transmission, disease density, and ever-present time.



After I have students play the game two or three times, recording data as they go, I ask them to graph it. Unfortunately I do not have a graph complete with explanatory markup, but the graph above does show the results of 5 different games (identified as infections). Yellow, green, and blue were winning games. The contrast between the green and orange games is an interesting one because in the orange game infections were kept largely in check, but team members ran out of time to cure the diseases. In the green game, treating infection was clearly less of a priority. (Students might be asked: If you have limited resources, how should you allocate them? What balance should there be between treating and curing disease?) The placements of cure and epidemics are the greatest source for examination. While most of the explanations have been lost, the green game's first turn ended with an epidemic and an outbreak. (What did that early calamity do to the rest of the game?)

Cooperatively Combating Infectious Disease

Pandemic is a board game that is unlike most games. While gameplay is card-based, it is not simple and it is not without strategy or real-world application. The game revolves around a problem that increasingly affects our society today: the spread of infectious disease. As Insel & Roth (2010) relay in Chapter 17, almost 13 million people die globally each year from the top 10 infectious diseases alone.

As a player in *Pandemic*, you fill a variety of roles (such as researcher, medic, or quarantine specialist), but the overarching objective is to discover the cures to four diseases which are being spread throughout the world.

Players work cooperatively, moving between 48 cities around the world to treat and contain disease, preventing disease outbreaks at all costs.

Outbreaks are one of three ways the team can lose the game: if there are more than 7 outbreaks (where disease spreads from one city to every surrounding city), the team loses. If more than 24 units of any single disease are present on the board at the same time, the team loses. And if the team takes too long (runs out of player cards), the team loses.

In the real world, each of these problems is a factor in failure as well. It is a serious problem when an unrestrained contagion spreads throughout the globe (a problem made easier as global travel becomes more commonplace). The SARS outbreak in 2002 and many more recent outbreaks have been made possible by the recycled air supply in aircraft and the incredible geographic spread of airline passengers. (Mangili & Gendreau, 2005)

It is likewise a problem when a large population is affected by a disease, as occurred during the famed "black plague" of the medieval ages or more recently with the flu epidemic of 2009-2010. (Helleman, 2009)

Time is always a factor. Even if precautions are taken, infections are likely to spread. Even when geographic relocation of carriers and the number of carriers can be controlled, many infections cannot be contained except with the most extreme quarantine procedures.

The game mechanics of *Pandemic* are well-crafted. The game begins by infecting a total of 9 cities: 3 cities start with the maximum number of 3 disease cubes while another 3 start with 2 and 1 cubes respectively. The type of disease that infects the cities is based on the region where the city lies (for example, the United States and Europe are part of the same [blue] region). From the first turn, players have to worry about the potential for disease outbreak: no city can have 4 cubes of the same disease; if a city should be infected with a fourth cube the outbreak counter is increased by one and every surrounding city is infected instead. (While cities will initially be infected by the disease of their

region, outbreaks often result in cities with multiple diseases.)

Players also start with a “hand” of 4 player cards. Player cards are most often cards representing cities. These city cards can be used as airplane tickets or permits to build research centers (you must be at a research center to devise a cure), or 5 cards of the same color can be “cashed in” for a cure. There are also a variety of other special event cards which enable players to forecast which cities will be infected next or skip an infection phase altogether. The worst event is an epidemic, which sees a new city infected with 3 cubes and the re-infection of previously-infected cities.

Users have 4 actions per turn to travel, treat disease, or develop a cure. Every turn ends by adding two new player cards to the player's hand and by infecting new cities. As the game progresses and more epidemics occur, the number of infected cities increases: at the beginning it is only 2 cities that are infected each turn but at the end of the game there can be 4 cities infected per turn.

The game is novel because it requires players to work together in an effort to conquer a common enemy: disease. Players are motivated to share strategies and help each other to best use their turns or best predict what may happen next. Players can “share knowledge,” or share city cards under very specific circumstances in order to more quickly attain a cure. (Achieving a cure for all 4 diseases is the ultimate endgame, and the only endgame in which players win.)

The mechanics and difficulty very closely mirror the real-world problem of tackling contagions, and offers a unique challenge to a team of 2-5 players. Creator Matt Leacock and publisher Z-Man Games are to be commended for their work. The game is one that can be played many times for a unique experience (the different abilities of the medic versus researcher helps with this, as does a number of randomized aspects). Players seem to enjoy the experience whether they win or lose and are certain to have learned something as a result. It opens players' eyes to the spread of disease in the real world, and includes tidbits of information such as the headquarters of the Center for Disease Control in Atlanta, where all players begin the game.

References

Helleman, C. (2009). Swine flu 'not stoppable,' World Health Organization says. *CNN Vital Signs*. Retrieved from http://www.cnn.com/2009/HEALTH/06/11/swine.flu.who/

Insel, P. M. & Roth, W. T. (2010). *Core Concepts in Health (11th Ed.).* New York: McGraw-Hill.

Mangili, A & Gendreau, M. A. (2005). Transmission of infectious disease through air travel. *The Lancet*, 365, 989-986.