Questions:

1. Macfarlane Burnet's predictions set the tone, echoed by Mackenzie throughout the chapter, for complacency in infectious disease research. As a result, medical schools downsized their infectious disease departments and students pursued different career trajectories. I think you also have to mention the shortsightedness and the arrogance that the medical field demonstrated in this case.4.5

6. It was considered unlikely for a parasite to completely wipe out a species because "new victims become scarcer." However, the North American gray squirrel study showed that if a species can tolerate a parasite while another cannot tolerate the parasite, the species that can't tolerate the parasite (red squirrels) will die off since the parasite has a host in which to continue multiplying. More importantly, the study showed the importance of understanding the interdependencies of an entire ecosystem as it related to infectious diseases. We are the species that can't tolerate certain diseases and we exist within an ecosystem, albeit one we have more control over, of animals that can tolerate this disease, making us incredibly vulnerable to the next big virus. 4.5

3. Our former agrarian societies were partly resistant to infectious diseases because farming required us to be sparsely located. As a result, HIV didn't have avenues to spread globally. However, when a group M strain was taken to Leopoldville by someone, it spread very aggressively. As the center of trade and commerce in the region, it attracted both workers and the lucrative sex trade. It's estimated that the number of sex workers increased from a few to 1000 per year. These workers left the Congo with

the virus, thereby giving it an avenue to flourish in new environments and infect new groups of people. The nature in which our civilizations were built are conducive to the spread of pathogens - as we concentrate in cities, viruses can begin (and have already done so) to exploit our numbers. 4.5

10. Pybus's work led to an understanding of where HIV came from by studying 800 blood samples. His team was able to trace the origins of HIV back to Leopoldville and then trace back the mutations from the genetic sequences to the original progenitor and create a family tree of the virus. He showed that without the concentration of humans in cities, deadly viruses such as HIV were confined to their original geographic locations. Pybus also worked in understanding the Brazilian viruses as well as the Zika virus - he found that they originated from Polynesia. He explained that their global spread could be a result of more frequent travel between the two continents. The study helped epidemiologists understand a "perennial problem with emerging diseases": since Zika cases have subsided now due to herd immunity and experimental vaccines must be tested with at-risk populations, the Zika vaccine unfortunately won't work when Zika makes a resurgence. 5

5. Daszak's work was instrumental in showing that zoonosis warranted caution and consideration. He and his colleagues determined that "60% [of the new pathogens] jumped to us from animals, and 72% of those, like Ebola and West Nile, came from wildlife." He also determined the locations of hot spots where "economic development was creating concentrations of humans close to wildlife," thereby showing the most likely places that we would see the widespread proliferation of wildlife-related pathogens. That

these places coincide with human intervention suggest that we have to be more proactive in combating these types of infectious diseases if we wish to continue living in cities and cutting down forests. 4.5

8. Deforestation results in degraded ecosystems that produce "'weed' species that live fast, die young, and don't invest much energy in fighting pathogens," making them ideal candidates for pathogens to spread quickly as there is a greater load of pathogens in the hosts left in the degraded ecosystem. The problem wouldn't be so pronounced in the original ecosystem since some hosts limit the spread of pathogens. Deforestation also displaces species that are vectors of disease transmission but normally don't interact with humans. Deforestation displaced bats in the village of Meliandou in Guinea, where the original dense village was cleared for farmland, which led to the bats later infecting the population of Guinea in record numbers. More importantly, deforestation doesn't just affect the community that cut down the forests but rather, it affects all communities that interact with the original, either directly or indirectly, and the effects compound.4.5
27.5/30=55/60

Paragraph:
In this chapter Mackenzie states that as a society we have been "complacent"
regarding the prevention of infectious viruses. Discuss at least four of the
reasons that she gives to explain this complacency.

Richer countries propagated a complacent attitude about the prevention of infectious diseases due to the previously successful suppression of infectious diseases, advancements in medicine, economic interests and a lack of effective disease surveillanceVery clear. Burnet's prediction that the "'future of infectious diseases is that it will be very dull'"(41) set the complacent tone and attitude , as Mackenzie echoes throughout the chapter, ~~for complacency~~ in infectious diseases research. As a result, richer countries' medical schools, like those in Harvard and Yale, downsized their infectious disease departments~~; and~~ students were encouraged to pursue different career trajectories, crippling future generations' ability to combat infectious diseases. That attitude also became the mainstream perception of infectious diseases~~; which allowed the public perception to~~ attention was shifted~~shift~~ to diseases related to "genes, environment, and lifestyle such as~~:~~ cancer, heart attacks, strokes, Alzheimer's, traffic accidents, the complications of smoking and obesity" (42). Burnet's opinion was based on research of the last 50 years of viruses that had been suppressedI'm not sure I would say that these viruses were suppressed!, through the use of drugs and vaccines, which led to the belief that richer countries "[could] readily suppress any [future infectious disease]" this indeed was a false conclusion that the medical world came to(48), creating a false sense of security**. Richer countries also had good "sanitation and hygiene, vastly better nutrition, as chemical fertilizers and crop breeding boosted agricultural yields, and refrigeration and railways distributed fresh food, with the added bonus of banishing disease-ridden livestock, like milk cows with TB, from cities" (44), reducing the number of infectious disease vectors, effectively removing them from the purview of rich countries**

rather~~**countriesrather**~~ **run on**. The scientific community also did not reconcile their predictions with the changing dynamics of “economic globalization, changes in food production, and population growth” (48). Certain diseases like “measles needs several hundred thousand people, the size of some medieval communities, to persist,”(48) suggesting that models designed in the 50s were~~are~~ no longer relevant. Diseases previously thought to be confined to their geographic origins and maybe some downstream towns “can re-emerge” (48) and are now taking the global stage due to the increased trade and travel between countries. Notably, these models were unable to predict the HIV pandemic, which got its lucky start when sex workers in Kinshasa had “up to 1000 different men a year, [and] left, some with HIV” (45). Lastly, disease surveillance “by former colonial powers” was reduced, citing “expensive anachronisms” as the reason behind these closures(42). Closing these research centres down was also short-sighted, as “early action Could have made ~~can make~~ huge differences in a pandemic” (42). The Ugandan lab that identified “Zika and 30 other viruses between 1930 and 1970” (42) could have identified HIV had there been enough funding. This complacency in the former colonial powers led to the dismissal of many disease vectors, causing countless deaths. The complacency of rich countries, fuelled by a false sense of security, has resulted in countless deaths and has detrimented the robust prevention of infectious diseases in the future. it is amazing to think that the medical world could have been so short-sighted as to not consider the new technological factors influencing trade and the delivery of goods.

Content: 68 Style: 21