The Science and Fiction of the Antibiotic Apocalypse

Lorenzo Servitje
Department of English
Health, Medicine, and Society Program
Lehigh University
los317@Lehigh.edu
@kilojoule_

"Imagine a world in which even the slightest scratch could be lethal. Cancer treatments, including chemotherapy, and organ transplants are no longer possible. Even simple surgery is too risky to contemplate, while epidemics triggered by deadly bacteria have left our health services helpless.

It is science fiction, of course—but only just."

—Rob Mckie, "Antibiotic Abuse: The Nightmare scenario"
The Guardian (2016)

- Michael T. Osterholm and Mark Olshaker, "Peer into the Post—Antibiotic Apocalyptic Future of Antimicrobial Resistance," *Wired*, 18 March 2017

- John Aziz, "Why the Post-Antibiotic World Is the Real-Life Version of the Zombie Apocalypse," *The Week*, 26 November 2013

- Ed Yong, "The Plan to Avert Our Post-Antibiotic Apocalypse," *The Atlantic*, 19 May 2016

Big Take Aways

1. A specific take about AMR as a phenomena, concept, idea in public and professional circulation, and as the subject of one mobile game—Superbugs

2. More broadly, an expanded and disrupted way of understanding biomedicine:

Forecast

1. Summary of what the humanities are and what interdsiplianry humanities on science and medicine looks like
2. Brief refresher on the science of AMR
3. Representations of AMR in popular culture and news media: apocalypse
4. Consider the incomprehsible scale of AMR as a "hyperobjects"
5. Think AMR's (factual) history
6. Look at AMR's science fictional present and future
7. Ask Why we should think critically, relative to the points above

The Humanities

Simply: The study of how human expirees is processed and documente; how we have created and are created by our world

History, English, Art History, Philosophy, Religious Studies, Classical studies, Comparative Literature, Film Studies

Cross over with social sciences:

Archaeology, Anthropology, Communications, Law and Linguistics

Interdisciplinary studies:

Medical/health Humanities, America Studies, Africana Studies, Environmental Humanities, Women and Gender Studies,

Terms

Antibiotic Resistance: Bacteria's ability to withstand or evade drugs designed to kill them

Resistome: Collective pool of antibiotic resistant genes bacteria contribute to and draw from

Hyperobjects: entities so massively distributed in space and time that they cannot grasped in their expansiveness or experienced directly

Resistance (2015), Sergey Mokritskiy (dir)

99,000 deaths per year US

The Review on Antimicrobial Resistance, chaired by Jim O'Neill. Antimicrobial Resistance: Tackling a crisis for the health and wealth of nations. Dec 2014.

700, 000 deaths per year globally

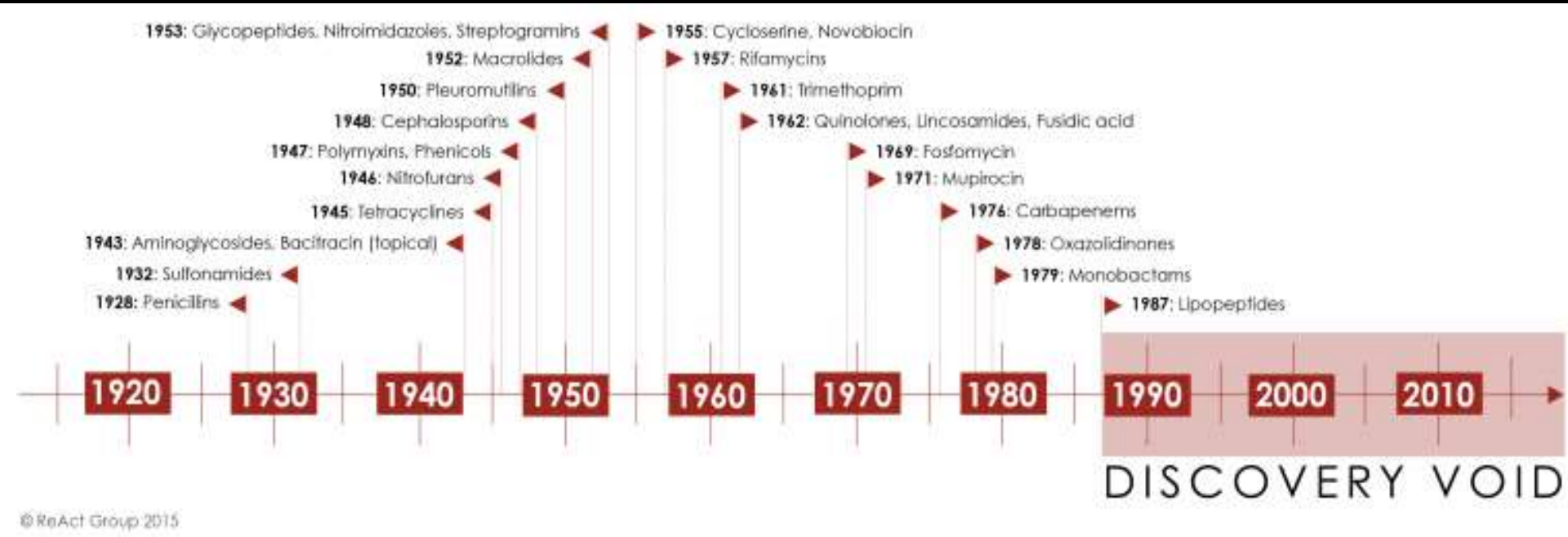
The Review on Antimicrobial Resistance, chaired by Jim O'Neill. Antimicrobial Resistance: Tackling a crisis for the health and wealth of nations. Dec 2014.

10,000,000 dead per year, by 2050

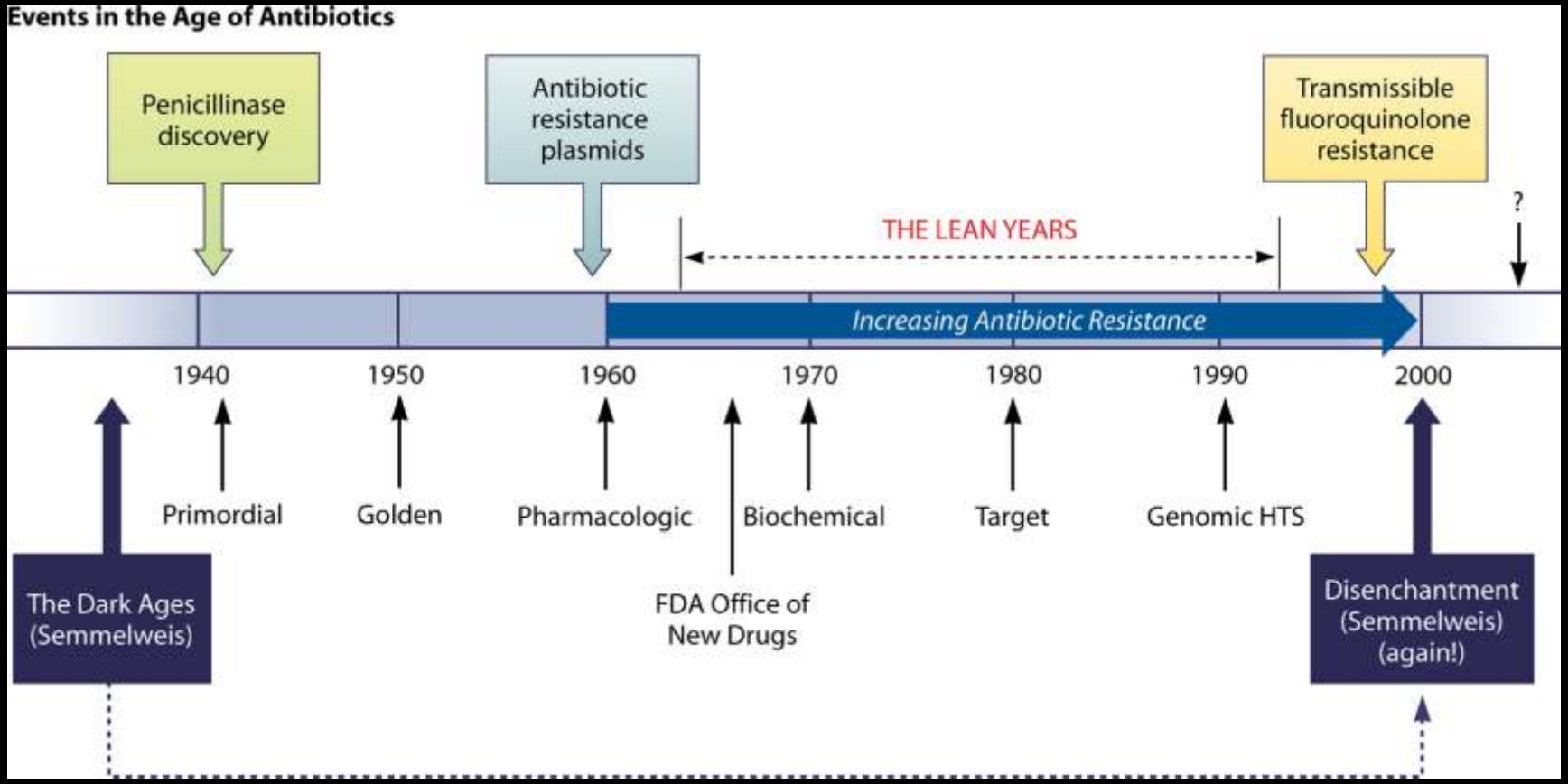
The Review on Antimicrobial Resistance, chaired by Jim O'Neill. Antimicrobial Resistance: Tackling a crisis for the health and wealth of nations. Dec 2014.

No new antibiotic classes since 1987

L.L. Silver, "Challenges of Antibacterial Discovery" *Clinical Microbiology Review* 24 no.1 (2011): 71-109



L.L. Silver, "Challenges of Antibacterial Discovery" *Clinical Microbiology Review* 24 no.1 (2011): 71-109



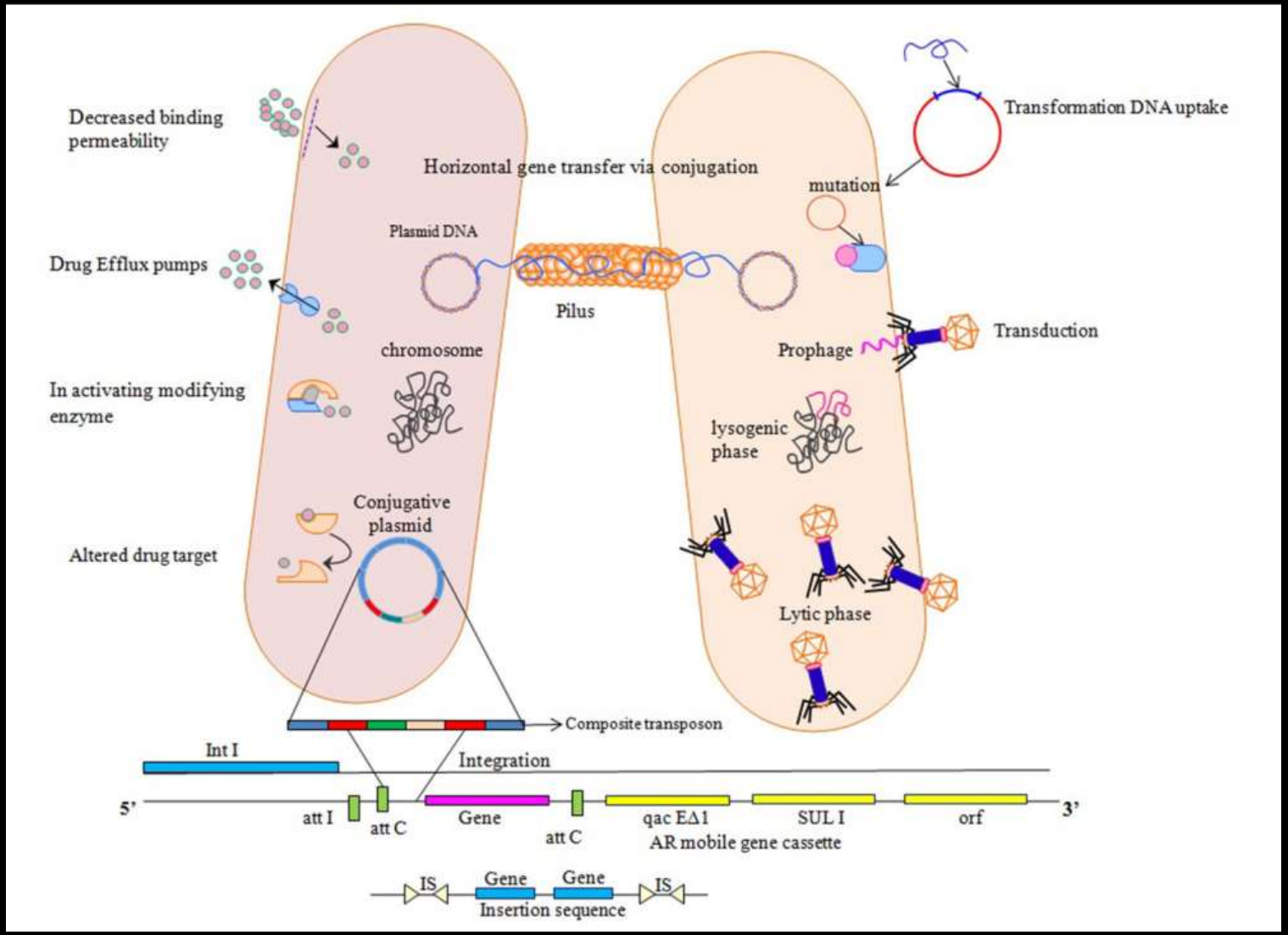
Julian Davies and Dorothy Davies, "Origins and Evolution of Antibiotic Resistance" *Microbiology and Molecular Biology* 74 no. 3(2010)

Why use Hyperobjects to think about AMR

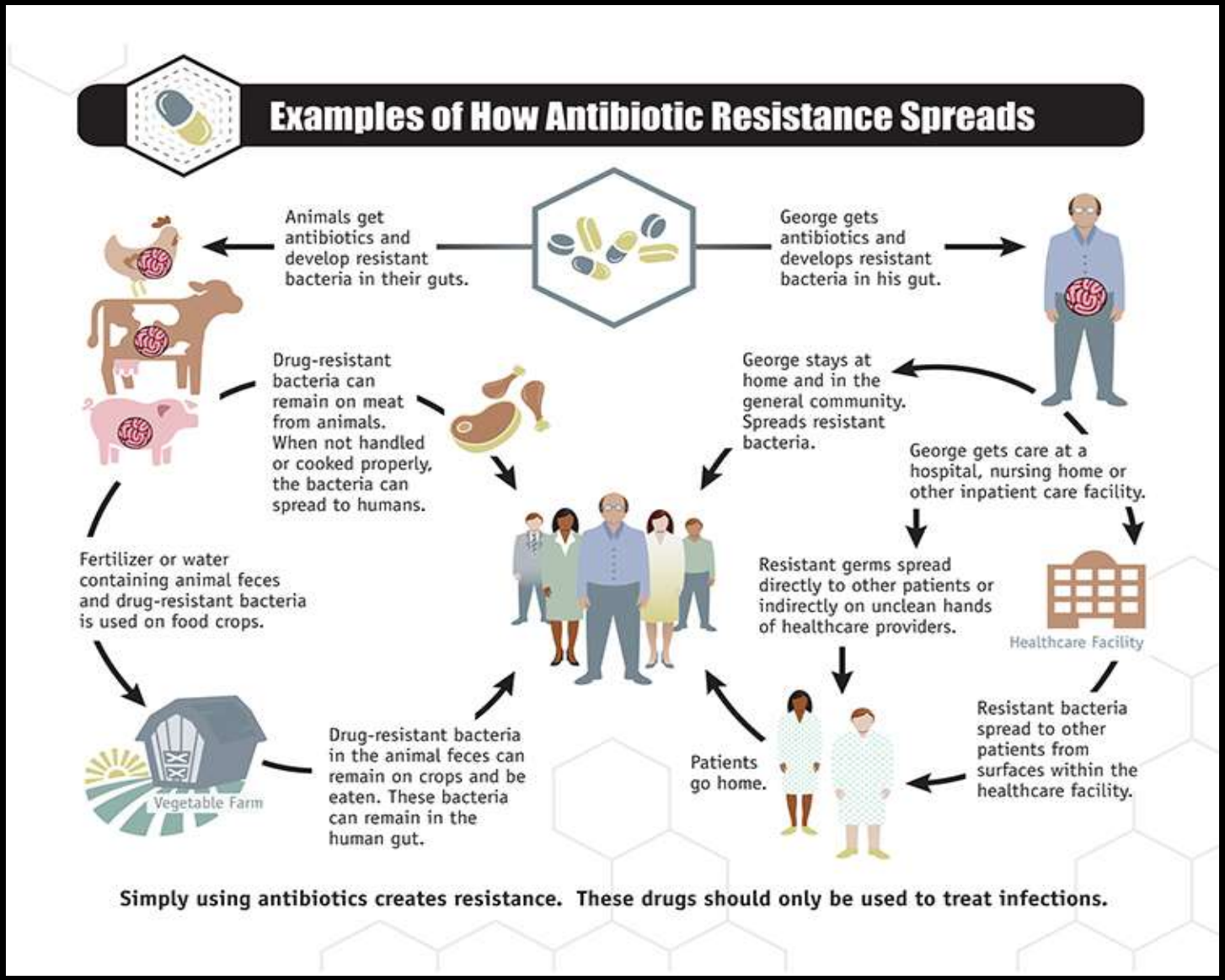
1. **Acknowledges the resistome as a material fabric that connects diverse ecologies and human/non-human assemblages (fancy word for a collection of things);**

2. **Decenters the tendency toward narrowing the scope of antibiotic resistance to the clinic and individual patient**

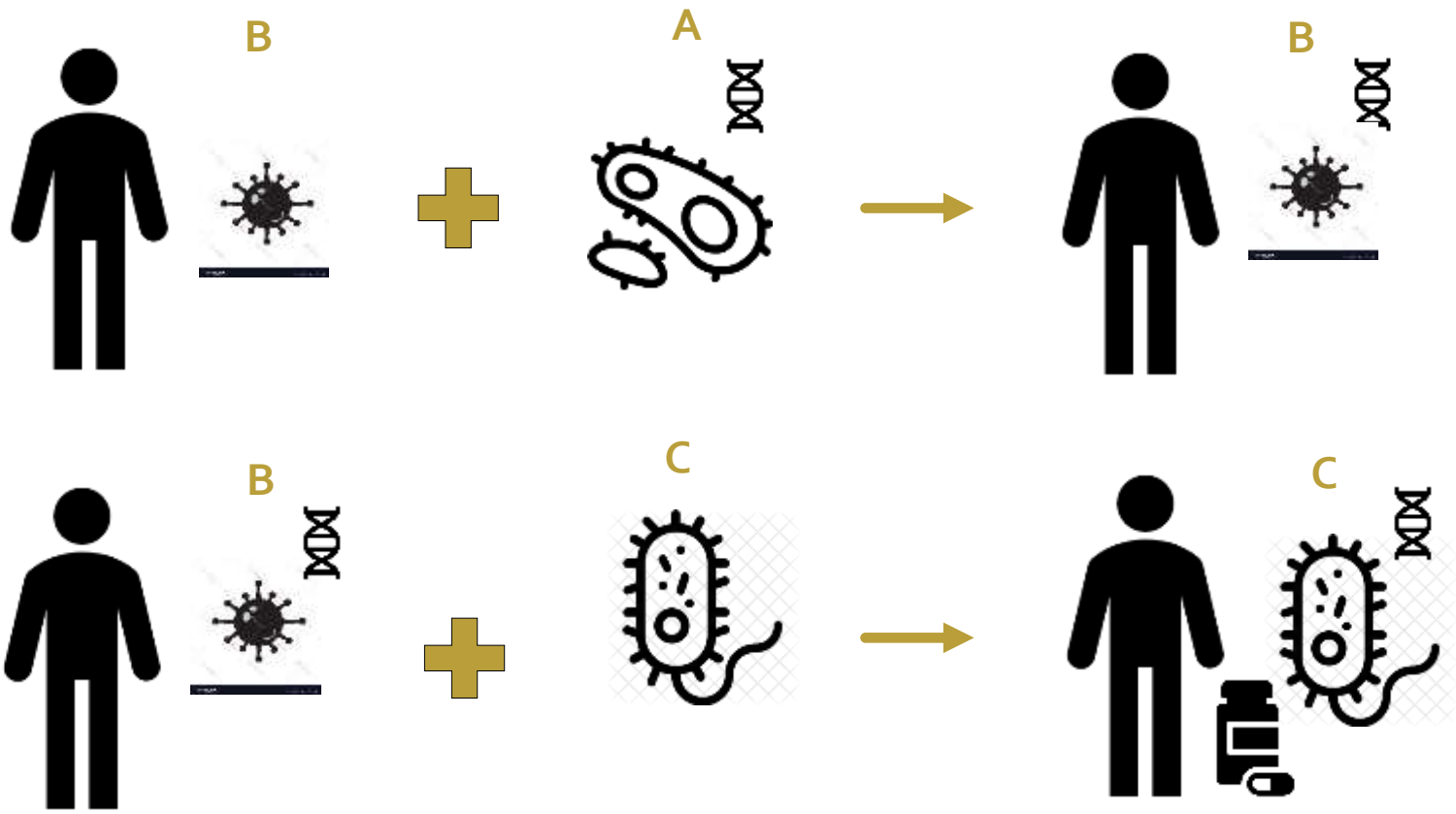
3. **considers the bioethical challenges that stem from thinking of antibiotic resistance at a temporal and global scale.**



Isha Sultan et al, " Antibiotics, Resistome and Resistance Mechanisms" *Frontiers in Microbiology* 9 (2018)



U.S. Centers for Disease Control and Prevention Report on Antibiotic Resistance Threats in the United States, 2013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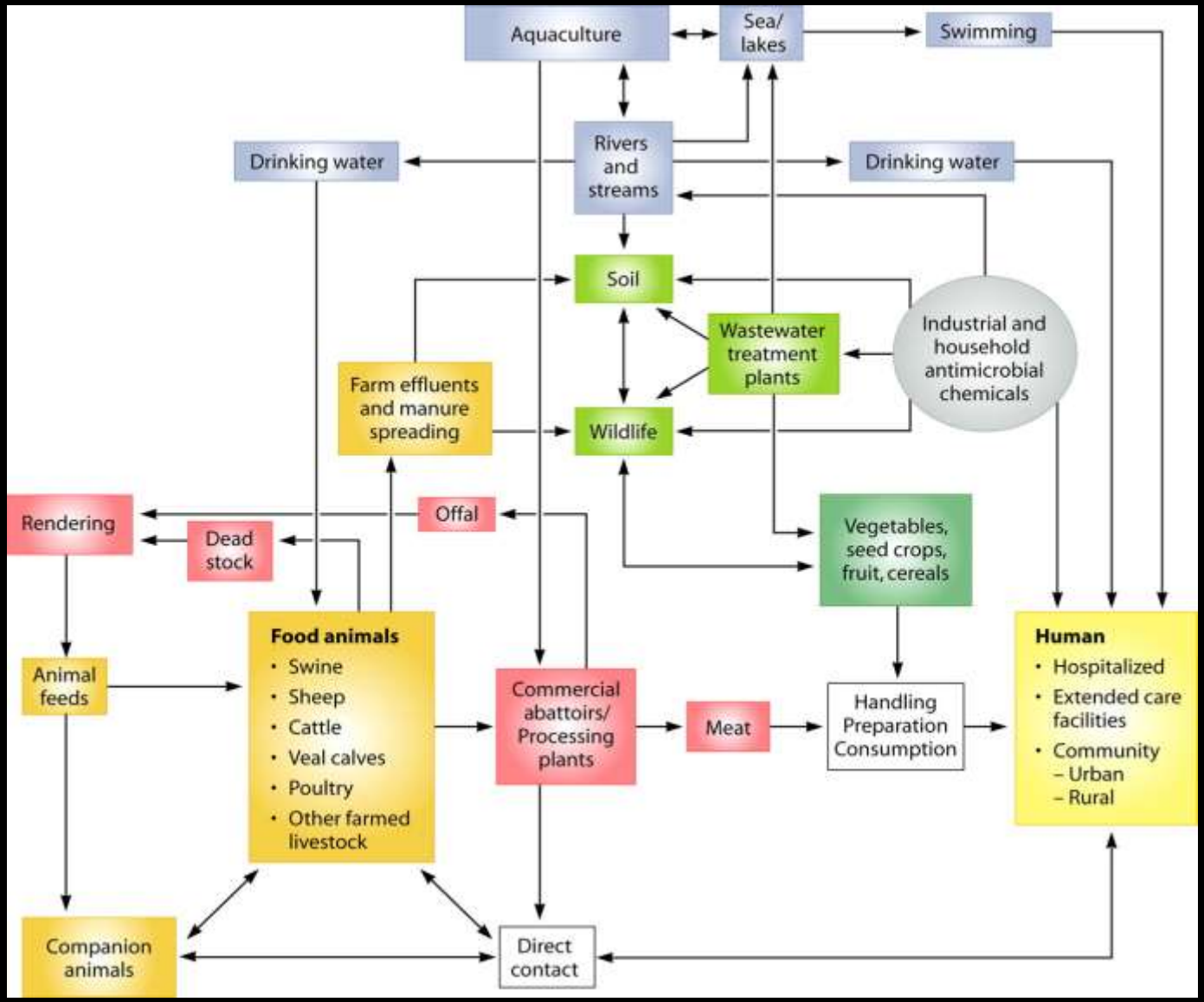

Julian Davies, and Dorothy Davies *Microbiology and Molecular Biology Review* (2010) doi:10.1128/MMBR.00016-10

'Dickensian diseases' are making a comeback in the UK

By Jack Guy, CNN

Updated 11:06 AM ET, Sat February 2, 2019

More from CNN


Botticelli 'imitation' painting turns out to be real


Spring breakers fight off would-be robbers and take their gun

Some Characteristics of Hyperobjects

- Viscosity
- Non-locality

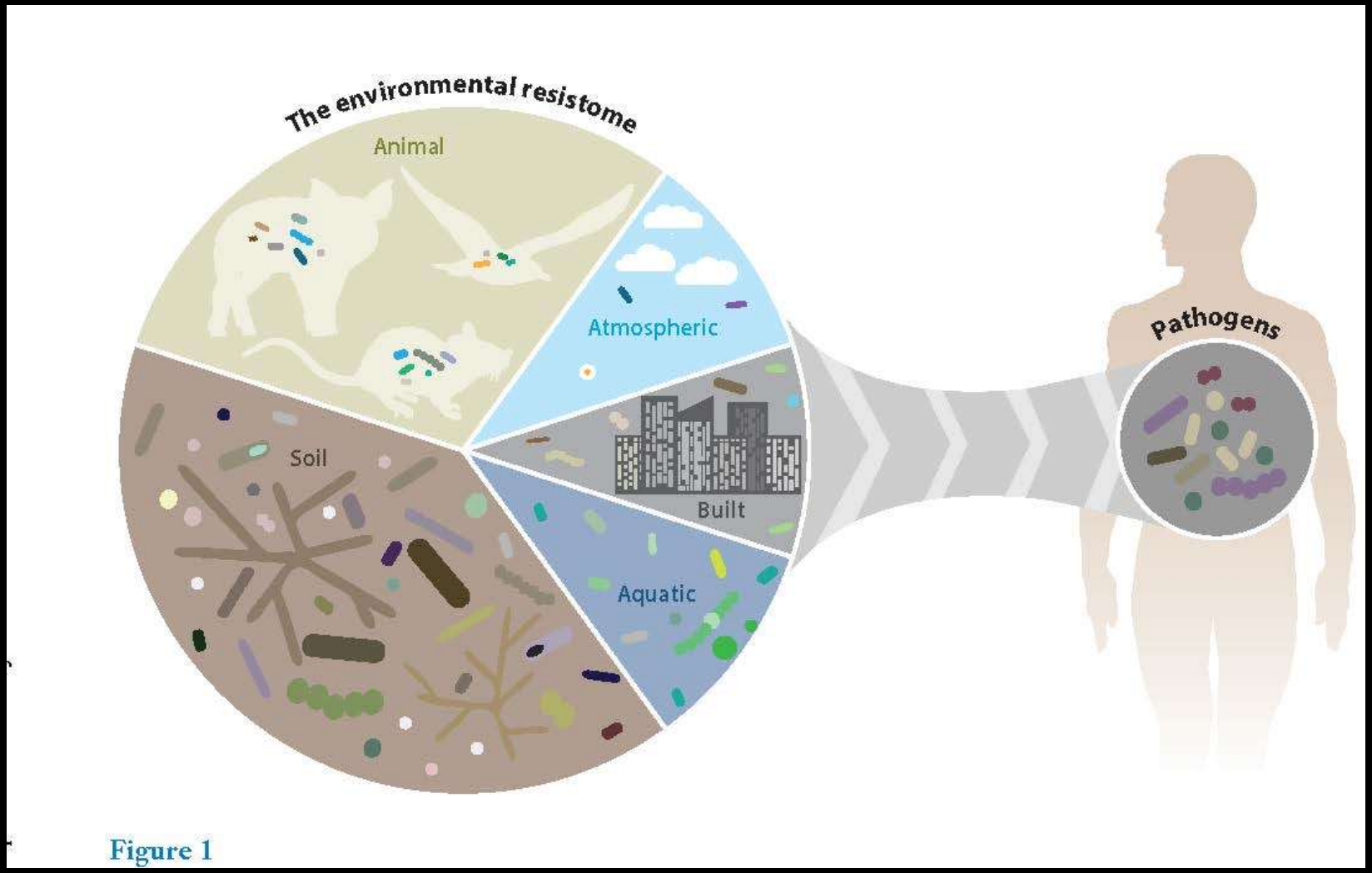

Figure 1

Matthew D. Surette and Gerard D. Wright, "Lessons from The Environmental Antibiotic Resistome" *Annual Review of Microbiology* 71 (2017): 309-29

Superbugs

***Superbugs* affords us a unique opportunity to observe the convergence of popular culture with the history of medical science.**

- It mediates a change in medical metaphors
- The game defamiliarizes AMR's history & present
- This prompts us to consider an inter-relational model of *balance* versus *war*

"We used to think a certain way about antibiosis and pathogens. *And then we changed the future*."

- Hannah Landecker (2015)

- ***Superbugs*** **allows the performance of AMR rather than showing or telling**

- **To "read"** ***Superbugs*****, we must consider**
  1. **Narrative**
  2. **Visual Aesthetics**
  3. **Mechanics/Algorithmic Logic (interactivity)**

Narrative Conflict between Players & Bacteria

Near Death

The End


YOU SURVIVED: 40 YEARS, 0 MONTHS
BEST: 48 YEARS, 11 MONTHS
100%
BACTERIA
2017
2020
2025
2030
2035
2040
2045
2050
Drug-resistant infections are already responsible for more than half a million deaths globally each year. This toll could exceed 10 million each year by 2050.
SHARE
CONTINUE
REPLAY

“Scary Graphs” & Cataclysmic Slopes

Applying Antibiotics

Research Lag

Scorched-Earth Pharmacology

Balance

Now What?

- Personal
- Medical
- Pharmacological
- Ethical
- Political
- Cultural

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Questions?

Lorenzo Servitje
Department of English
Health, Medicine, and Society Program
Lehigh University
los317@Lehigh.edu
@kilojoule_