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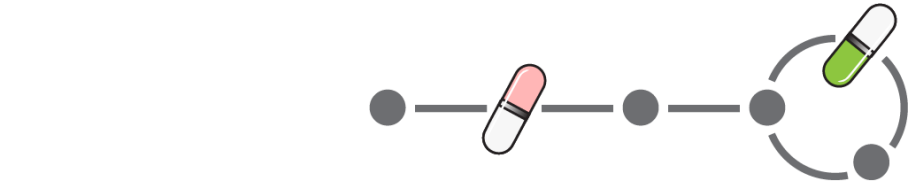

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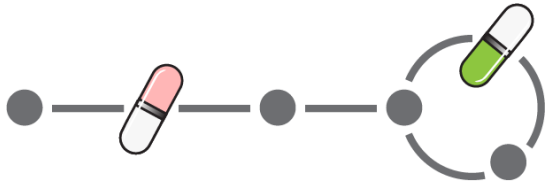

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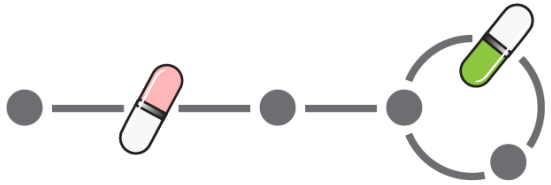

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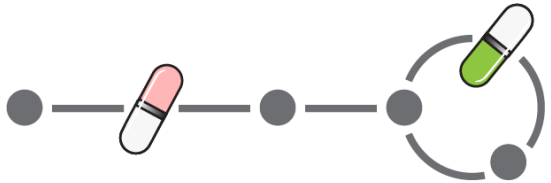

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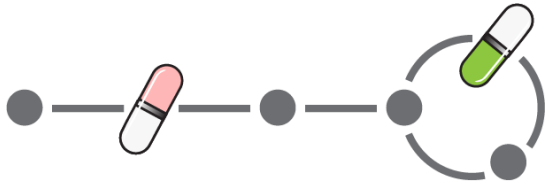

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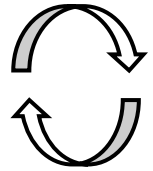

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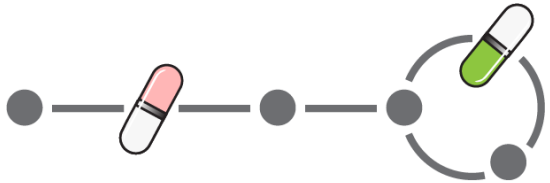

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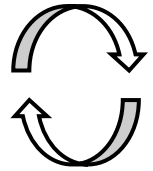
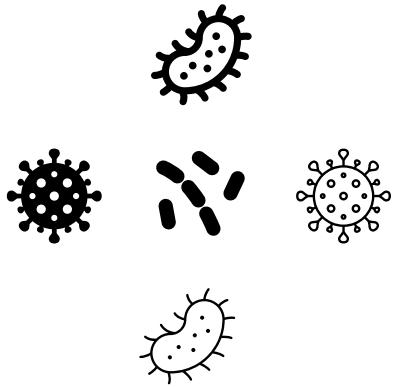


Ongoing clinical example

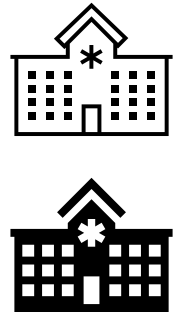
Leveraging heterogeneity in antibiotic prescribing preferences across hospitals and physicians to emulate target trials using electronic health records

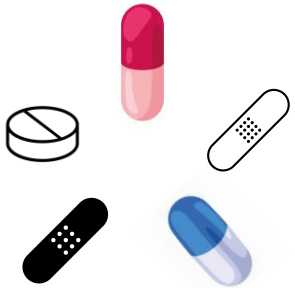


~100–200 known bacterial species causing sepsis

Comparative effectiveness

Across hospitals:
≠ guidelines
≠ practices

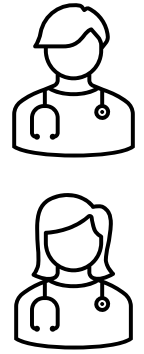




80+ antibiotics in hospital drug libraries

Drug safety

Among physicians:
≠ training
≠ preferences



Next steps

1. Extend the trial emulation pipeline to other drug classes.
2. Identify subgroups of patients likely to benefit the most/least from treatment.
3. Understand the mediating role of biomarker control.
4. Contrast matching/weighting approaches with other inferential strategies (e.g., using prescribing preferences as IVs).
5. Develop a framework to federate target trial emulations across databases, healthcare systems, and countries.

Current engineering needs

1. Build cohort datasets at scale, across 5+ databases, by extending existing algorithms
   a) AP-HP (2 ICUs, at Pitié-Salpêtrière and Henri Mondor hospitals)
   b) MIMIC
   c) eICU
   d) NIH All of Us
   e) UK Biobank and UK CPRD

2. Replicate a target trial investigating the renal and cognitive side effects of an antibiotic combination therapy of interest (piperacillin-tazobactam + vancomycin)

Thanks for your attention!

Any questions?

Feel free to reach out!
mlaurecc@gmail.com

Marie-Laure Charpignon
Sorbonne Université, Biostatistics & Epidemiology
Sorbonne Public Health Institute, PEPITES team