Assessing the Benefits of ARS R&D: How do we move Forward?

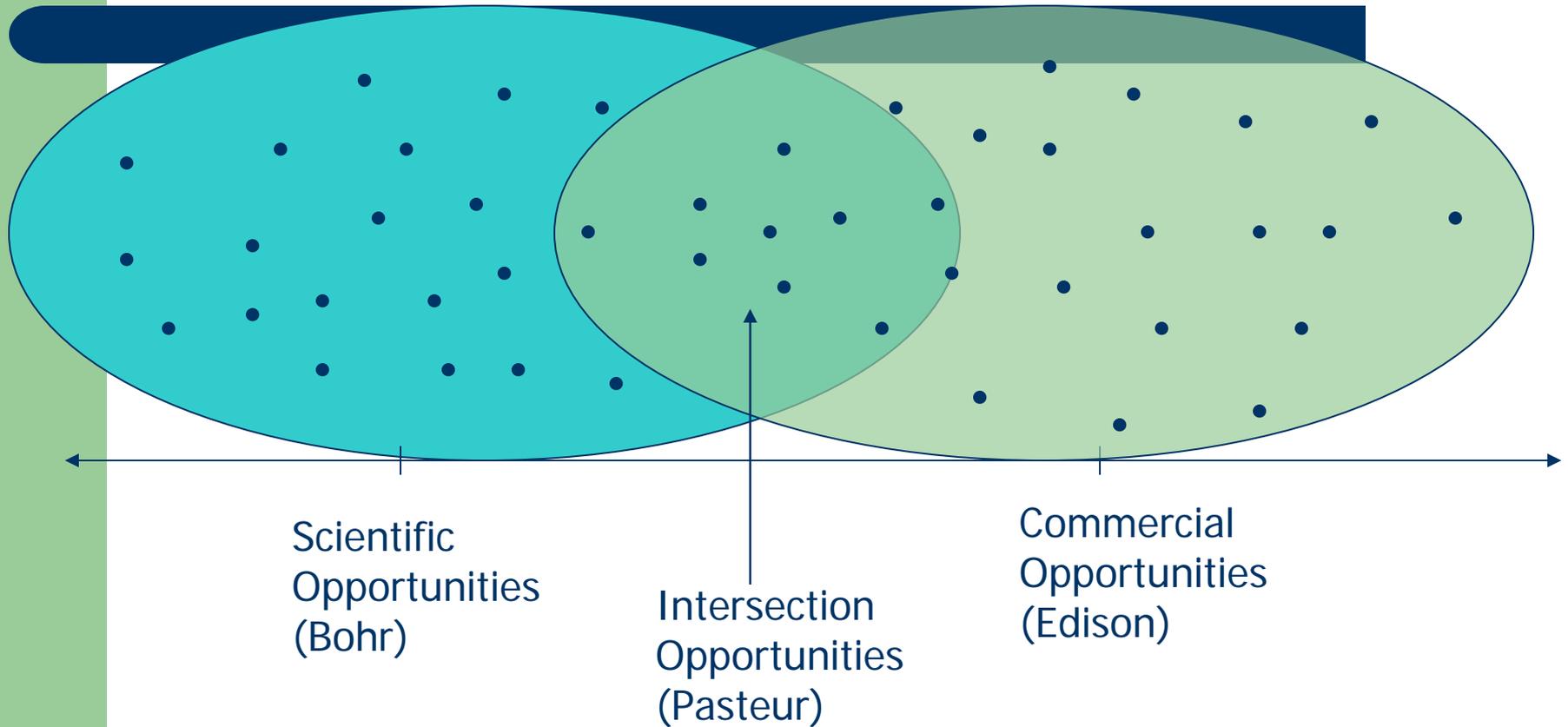Andrew Toole

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Must Address Three Big Challenges

1. Mindset "trapped" by history
   - ARS institutional evolution as "research organization" not "economic organization"

2. Agency commitment
   - Must devote time and money to the evaluation process

3. Extreme heterogeneity
   - Programs and projects have different objectives and outputs

Heterogeneity means researchers focus on different opportunities

Scientific Opportunities (Bohr)

Intersection Opportunities (Pasteur)

Commercial Opportunities (Edison)

Heterogeneous opportunities means: Economic "evaluation" is NOT appropriate at the project level

1. Scientific opportunities (i.e. funding allocation to scientific projects) should be performed by peer review – economic metrics not informative

2. Economic evaluation is informative at the National Program and overall ARS levels

Pursuit of varied opportunities gives rise to varied outputs

Need to "map" project outputs into economically meaningful "groupings"

Keys to Implementation

1. Start small and simple
   - Fold in complexity over time
2. Use case studies to illustrate the multiple varieties of impacts and complex interactions
3. Use economic studies to show overall contribution
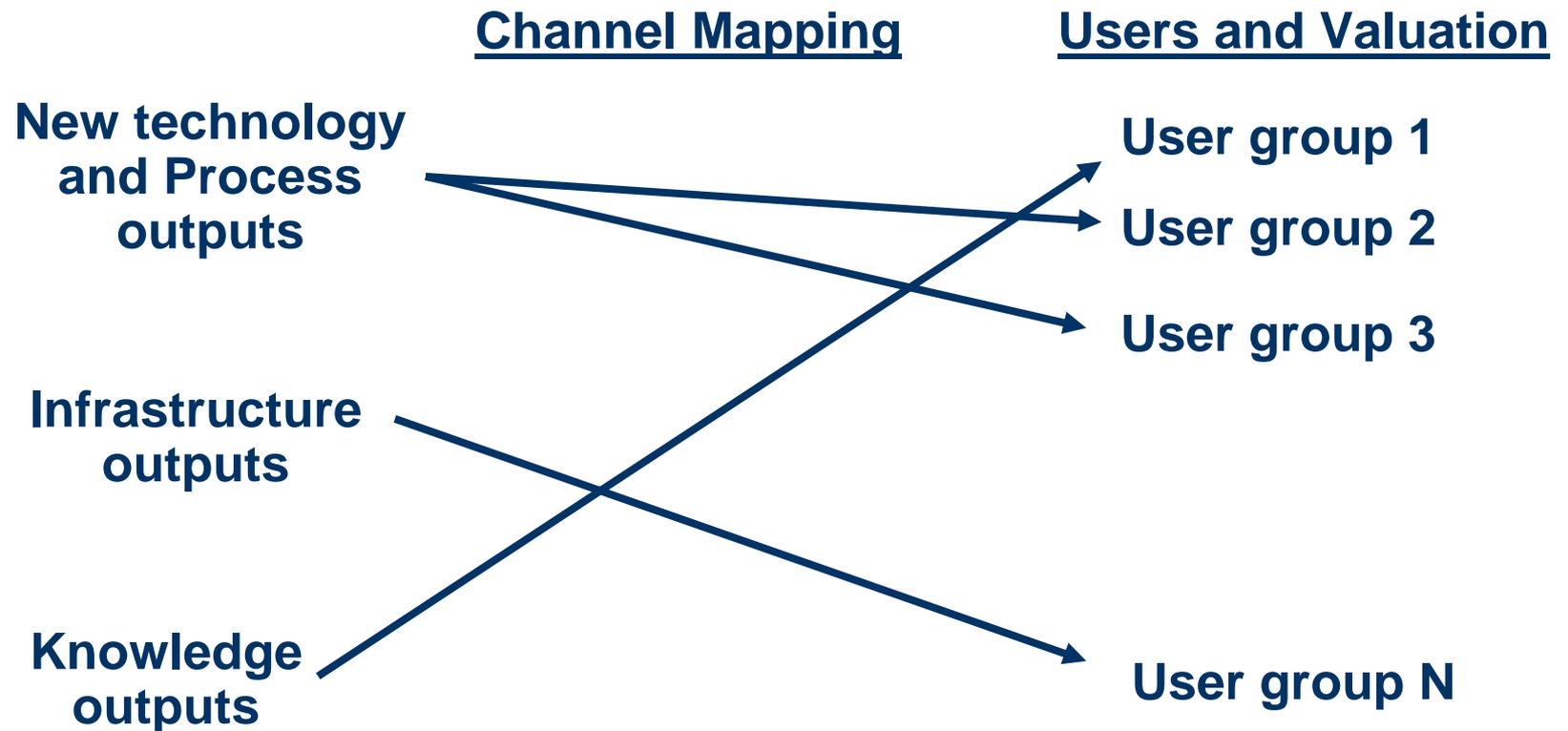
Groupings (for example)

NP 101 projects →

New technology and Process outputs

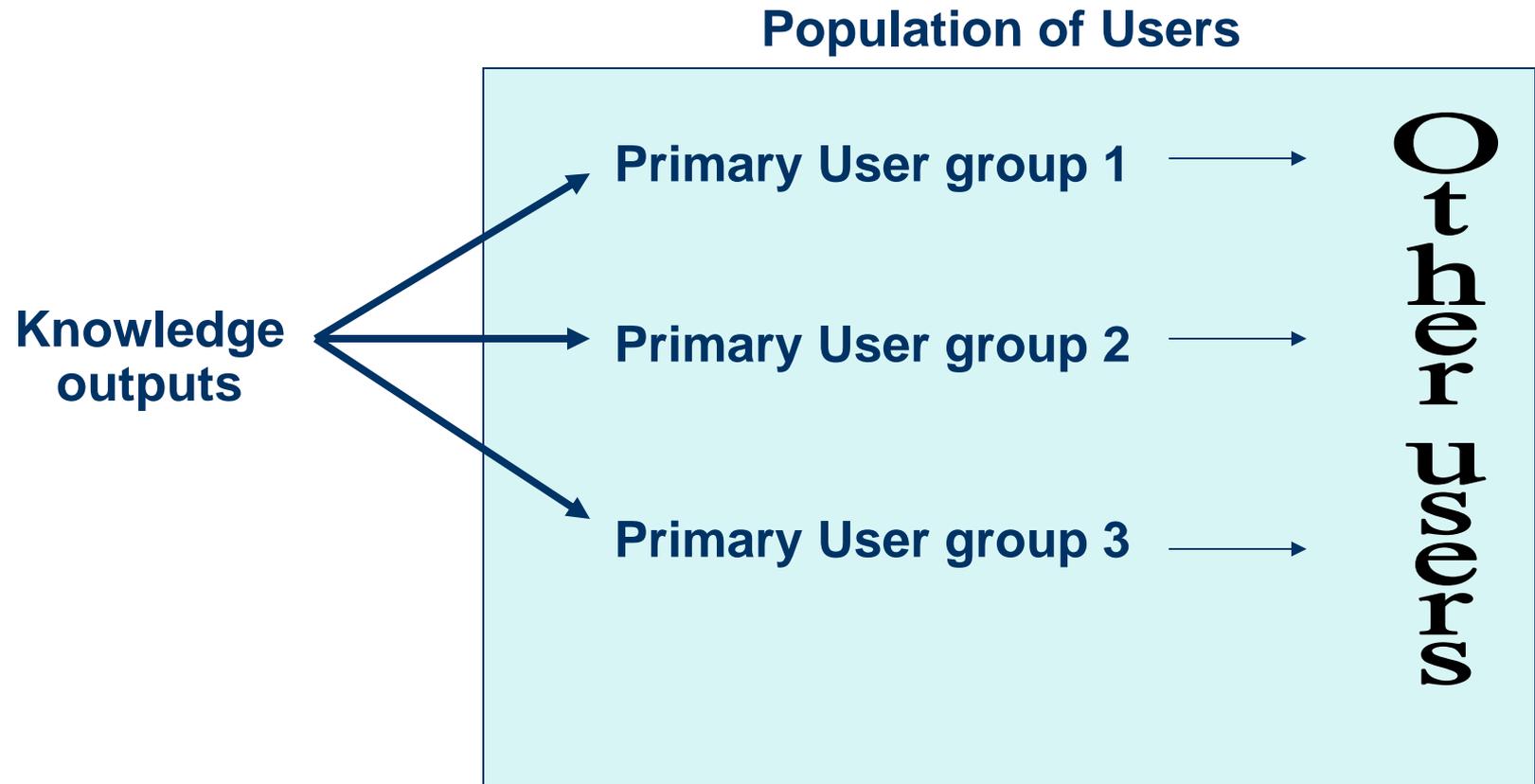Infrastructure outputs

Knowledge outputs

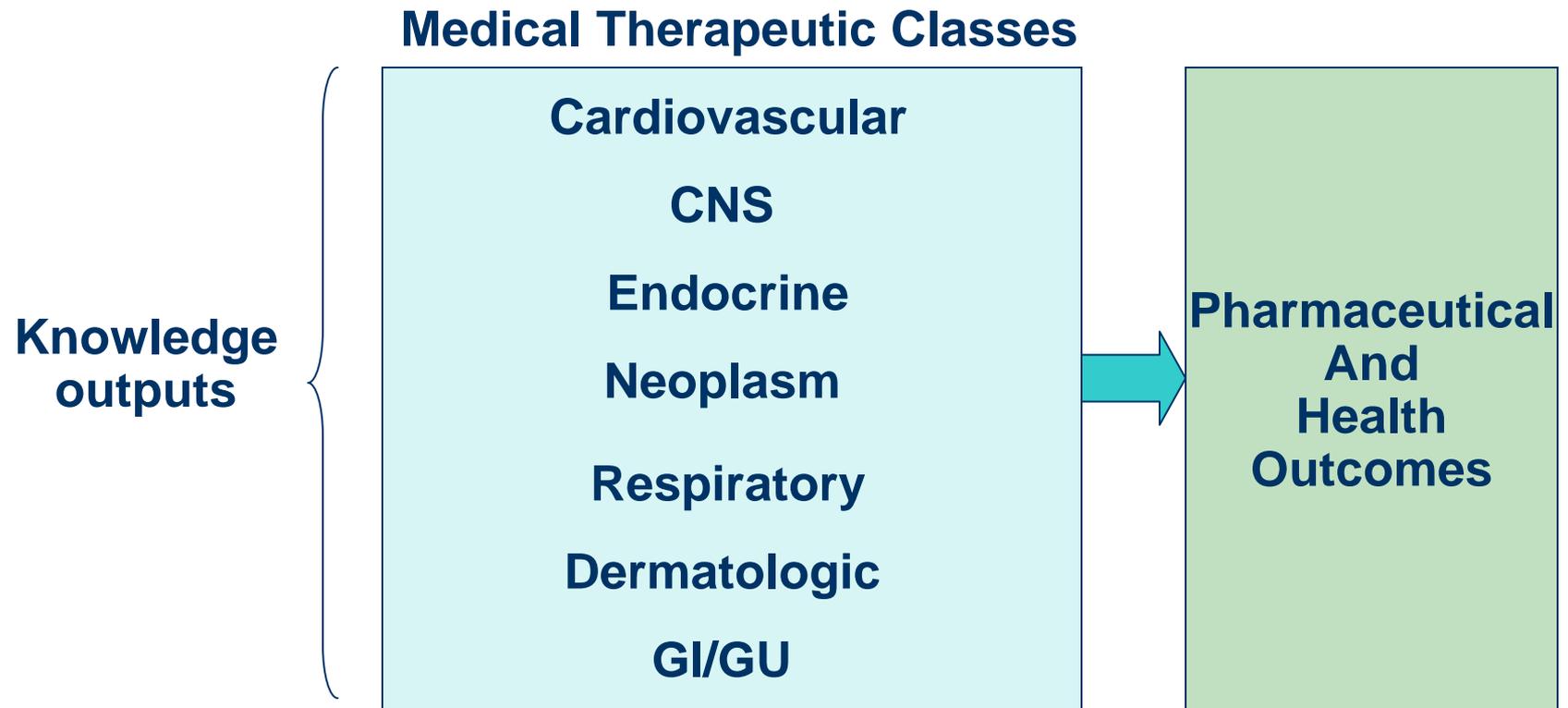# Economic Value flows through USE

Channel Mapping

Users and Valuation

New technology and Process outputs

Infrastructure outputs

Knowledge outputs

User group 1

User group 2

User group 3

User group N

Focus on "Primary" Users for Economic Valuation

Population of Users

Knowledge outputs →

Primary User group 1 →

Primary User group 2 →

Primary User group 3 →

Other users

My Research on NIH Extramural R&D

Medical Therapeutic Classes

Knowledge outputs

Cardiovascular

CNS

Endocrine

Neoplasm

Respiratory

Dermatologic

GI/GU

Pharmaceutical And Health Outcomes

Four Key Evaluation Results

1. NIH funded research makes an economically and statistically significant contribution to pharmaceutical innovation and R&D investment

2. NIH funded research impacts drug discovery – an average of 19 years prior to FDA product approval.

3. NIH funded research lowers mortality and (possibly) improves other health outcomes.

4. Average return to NIH funded research is 41% looking only at the pharmaceutical channel.

THANK YOU