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## Comparative Effectiveness Research Opportunities using the OHDSI Network

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### Abstract

*Comparative effectiveness research (CER) seeks to identify interventions that work best for which patients under what circumstances. As a response to a request from Congress, in the American Recovery and Reinvestment Act (ARRA) of 2009, the National Academy of Medicine (NAM) recommended a list of 100 national priorities for CER to be supported with ARRA funds. We examined this list of 100 research topics to determine how many and which could be addressed using the OHDSI platform. Amongst the top 100 research topics, 35 were found amenable to study using OHDSI OMOP formatted data sources and OHDSI population estimation or patient prediction packages in R. Out of the 35 topics addressable, 19 investigate pharmacological agents. This analysis represents an opportunity for one third of the top 100 national CER priorities to be addressed and operationalized using the OHDSI platform.*

### Background

The NAM list of national CER priorities<sup>1</sup> identified areas of research with potential for the highest impact on patient care and informs the priorities for the Patient-Centered Outcomes Research Institute (PCORI). PCORI was established by the Affordable Care Act (ACA) to address the effectiveness of existing drugs and treatments. The impact of PCORI has not yet been fully realized<sup>2</sup> and with funding for PCORI authorized through 2019, conducting CER to address national priorities is crucial. The OHDSI multi-stakeholder, interdisciplinary collaborative is well positioned to address CER priorities as it employs a common data model (CDM), standard population estimation and patient level prediction tools, and represents 600 million patient lives across several data sources.

### Methods

The list of 100 national priorities for CER was obtained from the website of the health and medicine division of the National Academies of Sciences, Engineering, and Medicine<sup>1</sup>. Each research priority topic was evaluated by three experts in database research based on availability of critical exposure and endpoint data. Definitions of the population(s) under study, the target exposure(s)(T), the comparator group(s)(C), and the outcomes(O) were assigned for each research topic addressable using OHDSI platform data.

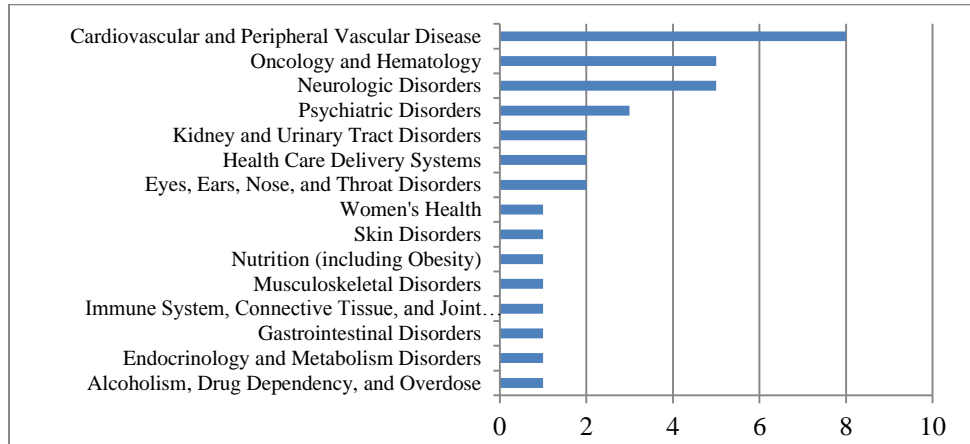
### Results

Among the top 100 NAM CER research priority topics, 35 were determined addressable using the OHDSI platform data and tools. Among the identified 35 CER addressable topics, 16 ranked in the upper two quartiles and 19 ranked in the bottom two quartiles. Nineteen of the 35 OHDSI addressable studies included use of pharmacologic agents. Out of the 35 studies, 15 research areas are represented, eight of which are in the cardiovascular and peripheral

vascular disease area (Figure 1). Out the eight studies in the top quartile T consisted of four medical procedures and four drug treatments, while the C consisted of three medical procedures and five drug treatments (Table 1).

### Discussion

Although the NAM published the 100 CER research priority topics, further definition was required to elucidate clear CER research questions. The T/C/O definition was assigned for each research question in order to determine if the topic is addressable using OHDSI data and tools. Use of the OHDSI platform will increase efficiency, use of multinational data, and lend meaningful insight into the 35 amenable CER studies. We encourage use of the OHDSI network to address the 35 CER studies identified among the NAM CER research priorities.



**Figure 1.** Research Areas of CER Studies Addressable using the OHDSI Platform

<i>Outcome</i>	<i>Target</i>	<i>Comparator</i>
Stroke	P	D
Morbidity, quality of life, and diagnosis of esophageal adenocarcinoma	P	P
Progression to rheumatoid and psoriatic arthritis	D	D
Survival, side effects, quality of life, and costs; complication rates, readmission rates, and rates of additional cancer therapy	P	P
Cause of death, dementia with Lewy bodies, frontotemporal dementia, vascular dementia, primary progressive aphasia	D	D
Cause of death, dementia with Lewy bodies, frontotemporal dementia, vascular dementia, primary progressive aphasia	D	D
Diagnosis, staging and monitoring time to metastases	P	P
Breast cancer	D	D

P = Medical procedure; D = Drug treatment

**Table 1.** Outcome, Target, and Comparator for 1<sup>st</sup> Quartile of CER Topics Amenable to Study Using the OHDSI Platform

### References

1. <http://www.nationalacademies.org/hmd/Reports/2009/ComparativeEffectivenessResearchPriorities.aspx>
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3. <http://www.nationalacademies.org/hmd/Reports/2009/ComparativeEffectivenessResearchPriorities.aspx>

