



Value of genetics-informed dosing guidance in pregnant women

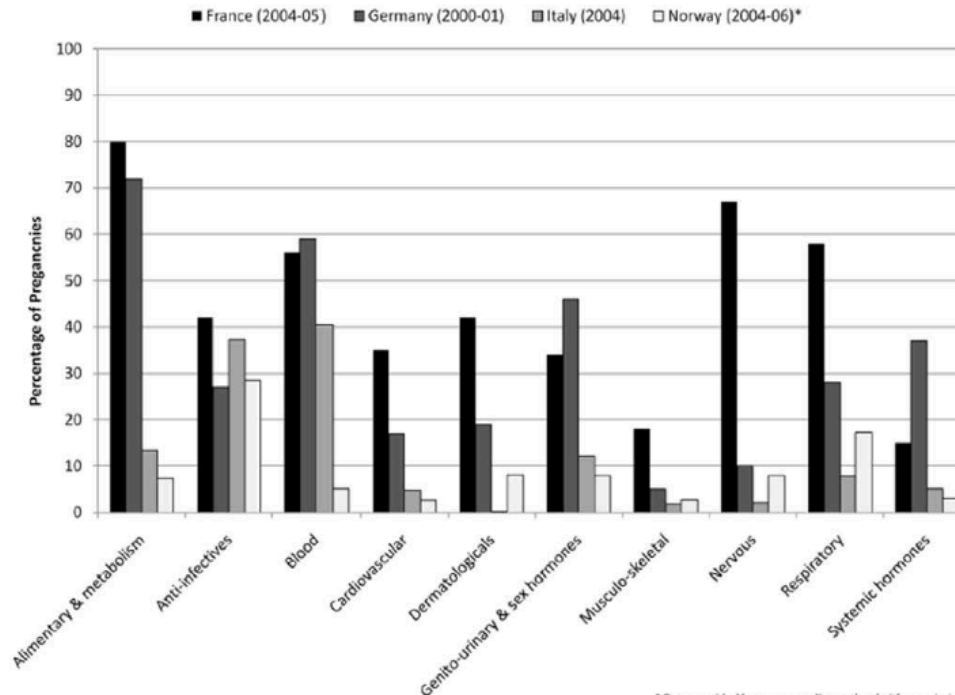
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Outline

- Prescription drug use in pregnancy
- Importance of maternal genetics in drug prescribing
- Opinions for obstetric healthcare providers
- Research opportunity to recognize a harmful or ineffective drug
- Opportunities for CPIC

Prescription drug use is on the rise and prescribing practices may vary

- Increase in use over the course of a 33-year study (*Mitchell et al 2011*)
- Women are delaying pregnancy (*National Vital Statistics Reports 2015*)
- Higher rates of obesity and chronic medical conditions
- Variability in prescription practices
- Most drugs are used off-label



Pharmacogenetics data on medications may be used to find effective and safe doses



- FDA includes pharmacogenomics information in the labeling of several medications commonly prescribed in pregnant women
- Maternal pharmacogenetics will play a role in determining disposition and response to drugs
- **Initial steps to understand value to obstetric health care providers**

Survey to assess perceived needs of obstetric healthcare providers at JHU



- Experience adjusting drug dose in pregnant women
- Experience treating pregnant women with drugs known to be influenced by genetics
- Opinions about resources for using genetics to guide drug dosing in pregnant women
- Demographics (specialty, years practicing, etc)

Survey study sample

Characteristics	Healthcare Providers (N=31) N (%)
Gender	
Female	27 (87%)
Experience	
Resident	10 (32%)
Attending	17 (55%)
Specialty	
Obstetrics	29 (94%)
Gynecology	2 (6%)
Years science completing training	Median 10 (1-36)

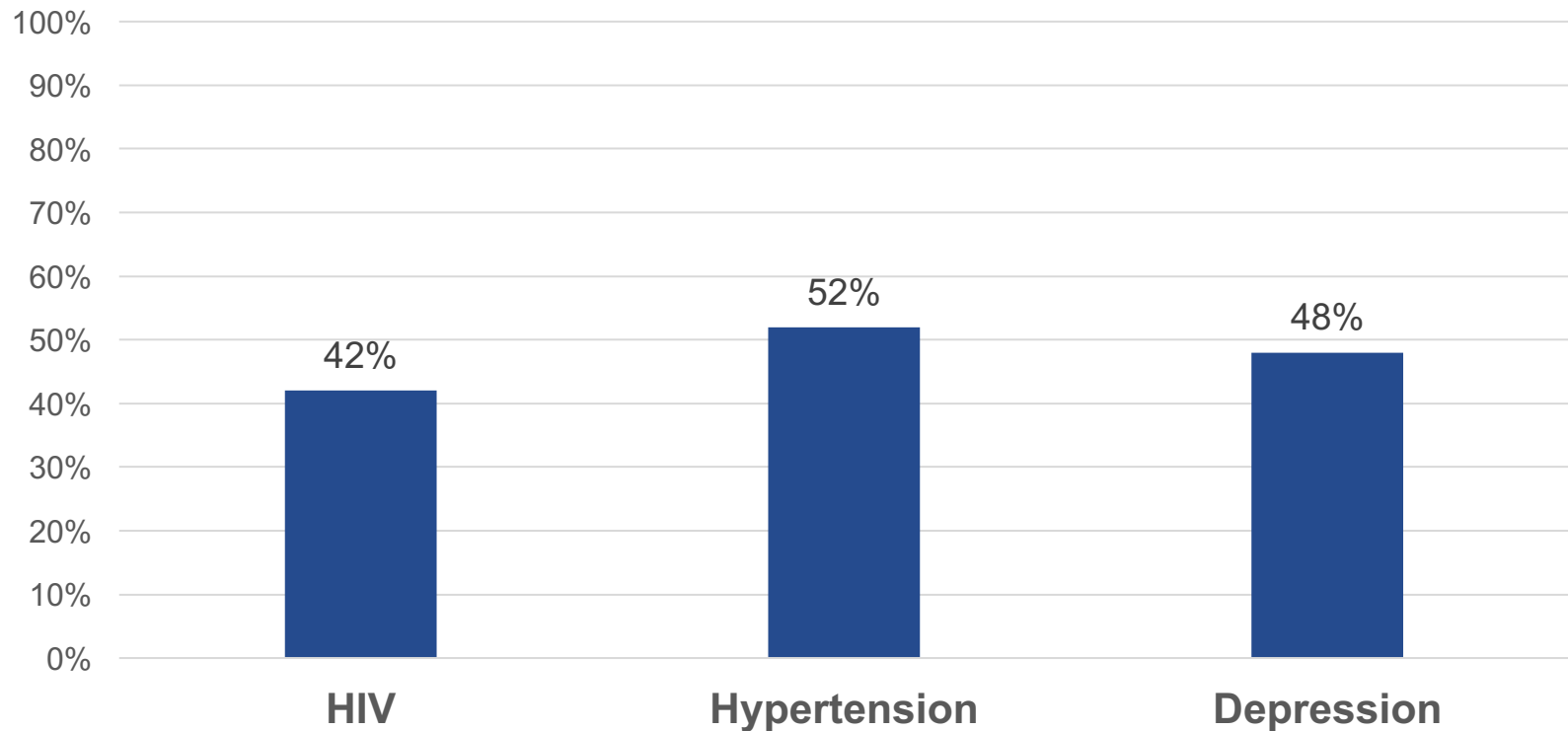
Finding: Dose adjustments are common and involve several characteristics

- Organ system function (84%)
- Body weight (81%)
- Height (31%)
- Body surface area (47%)
- Genetics (16%)
- Other characteristics (16%)

Finding: OBs believe genetics-informed dose adjustment is critical for good outcomes for the treatment of pregnant women



Important or Very Important for Good Outcomes



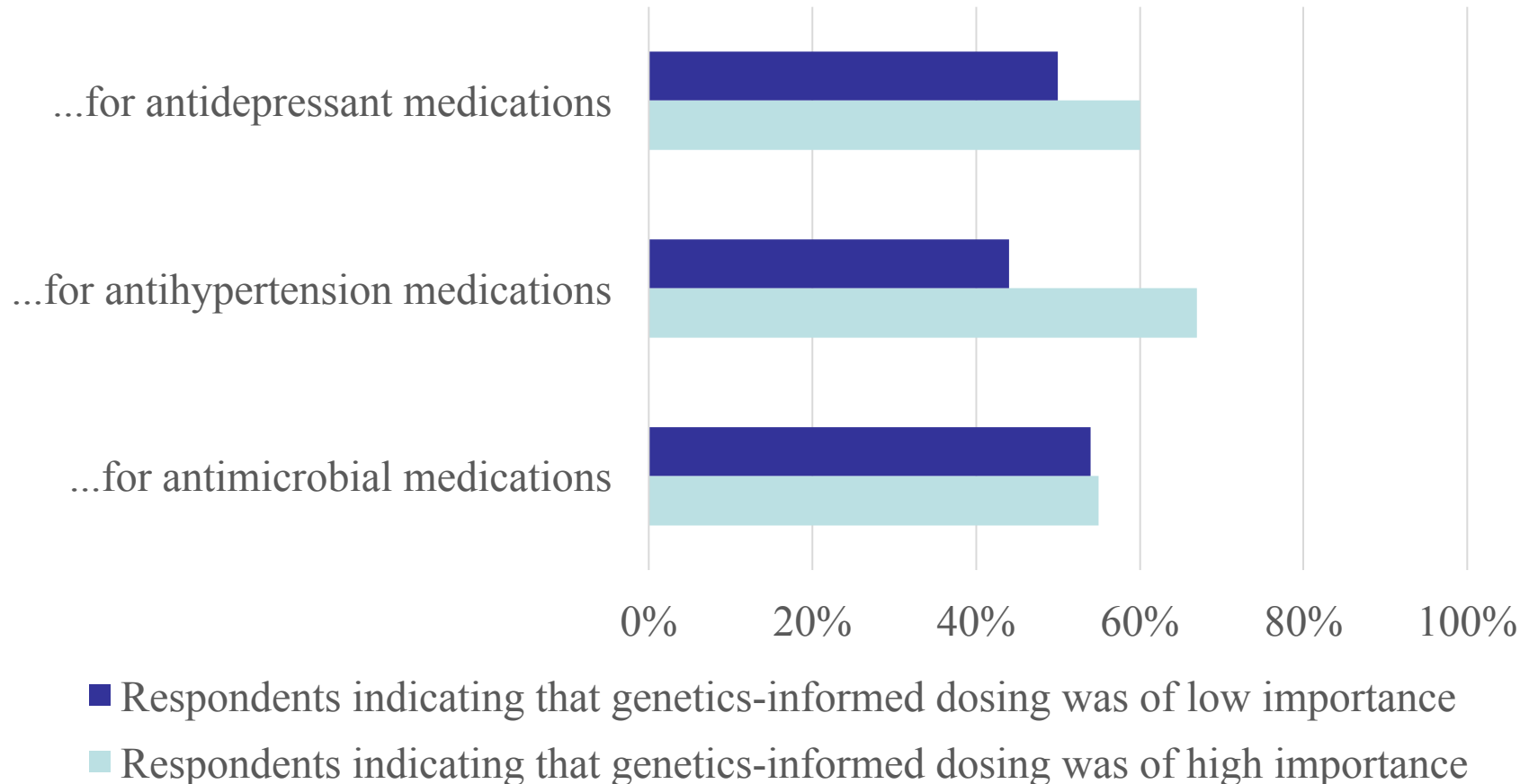
Treated conditions during pregnancy

Finding: OBs are largely unaware of resources for clinical guidance on genetics-informed drug dose use in pregnancy

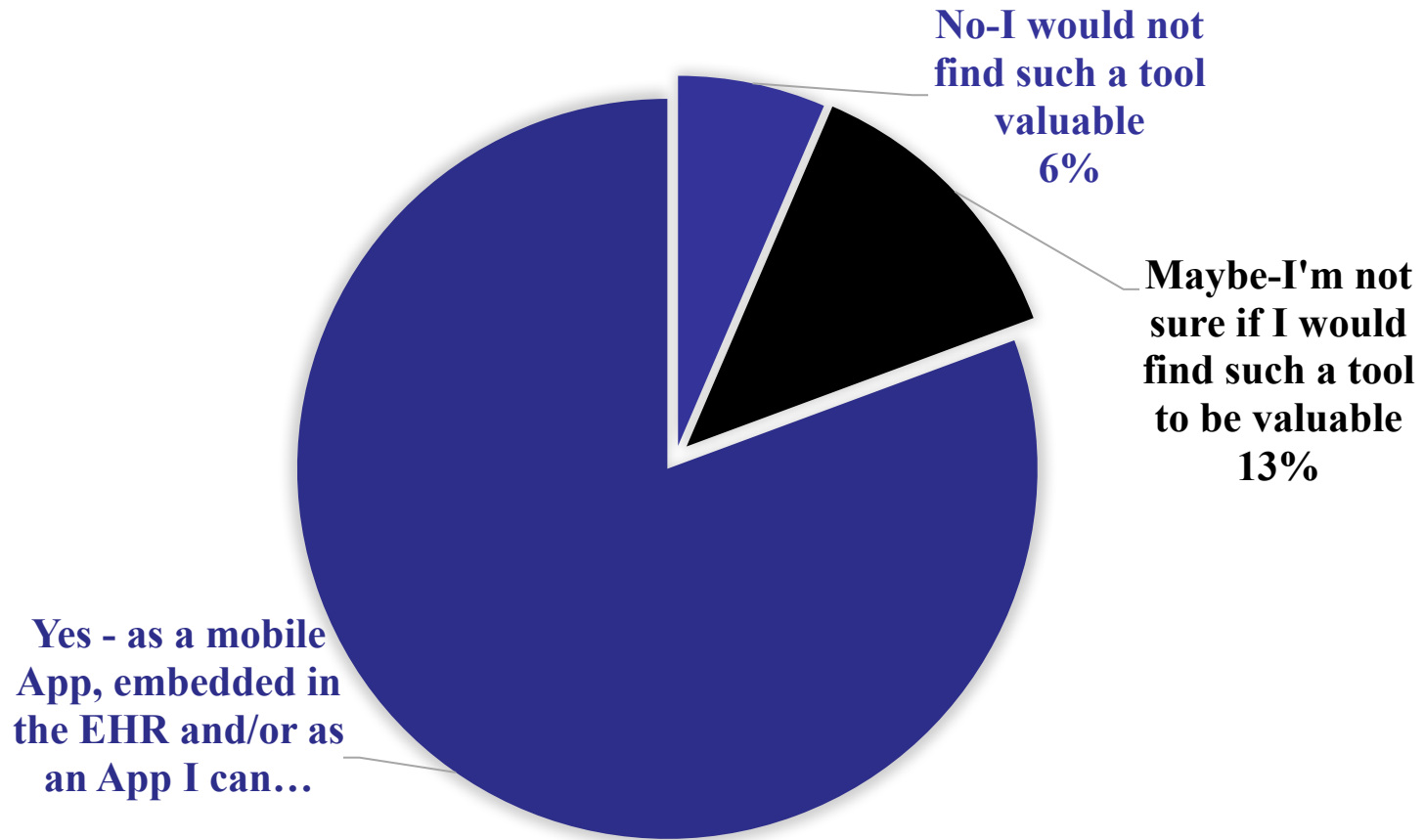


- Rarely seek outside consultation for drug dosing (<25% of the time)
- 37% were aware of any resources for clinical guidance on genetics-informed dosing
 - FDA resources, Micromedix, REPROTOX, UpToDate, OMIM, PubMed, lab report
 - 70% indicated moderately or slightly convenient to obtain

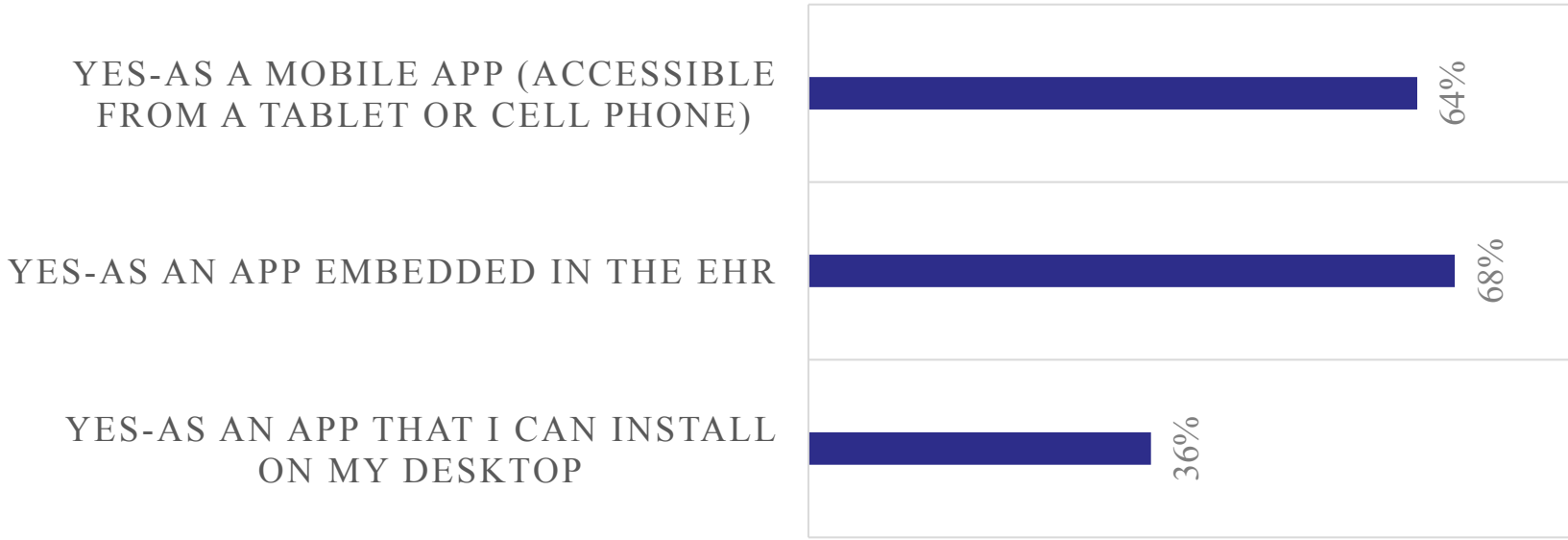
Finding: OBs would find it valuable to have access to a consult service to provide genetics-informed dosing guidance for pregnant women



Finding: OBs would find it valuable to have access to an app to provide genetics-informed dosing guidance for pregnant women



Finding: OBs would value access to clinical guidance via multiple modalities



Summary of points

- Dose adjustments are common in pregnant women, with outside consultation rarely used
 - Genetics is rarely used
- Few indicated an awareness of clinical guidance on genetics-informed dosing or had ever used any
- Most would find access to genetics-informed dosing information valuable
 - As an App in the EHR, App installed on a tablet or cell phone, App installed on a desktop

CPIC opportunities

- CPIC is addressing difficulties translating genetic lab test results into actionable prescribing decisions for affected drugs
 - "...creating, curating, and posting freely available, peer-reviewed, evidence-based, updatable, and detailed gene/drug clinical practice guidelines"
- Opportunities highlighted here
 - Guidelines specific to pregnant women
 - Computable guidelines
 - Increase awareness of CPIC guidelines among Obs

Acknowledgments

- “Value of Genetics-informed Drug Dosing Guidance in Pregnant Women: A Needs Assessment with Obstetric Healthcare Providers at Johns Hopkins” (Casey L. Overby, Ph.D., Phillip Thompkins, B.S., Harold Lehmann, M.D., Ph.D., Christopher G. Chute, M.D., M.P.H., Jeanne S. Sheffield, M.D.), AMIA 2017 accepted paper presentation
- Similar material presented at eMERGE Network Steering Committee Meeting June 9th, 2017
 - eMERGE Phase III: U01HG8679 (Geisinger Health Clinic)



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M E D I C I N E

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