

EHDEN-HMB is the largest multinational real-world study to date of women diagnosed with heavy menstrual bleeding (HMB) using 9 data sources standardized to the OMOP CDM

HMB incidence and co-occurring conditions pre- and post-diagnosis varied by country, indicating variation in HMB management in different healthcare settings

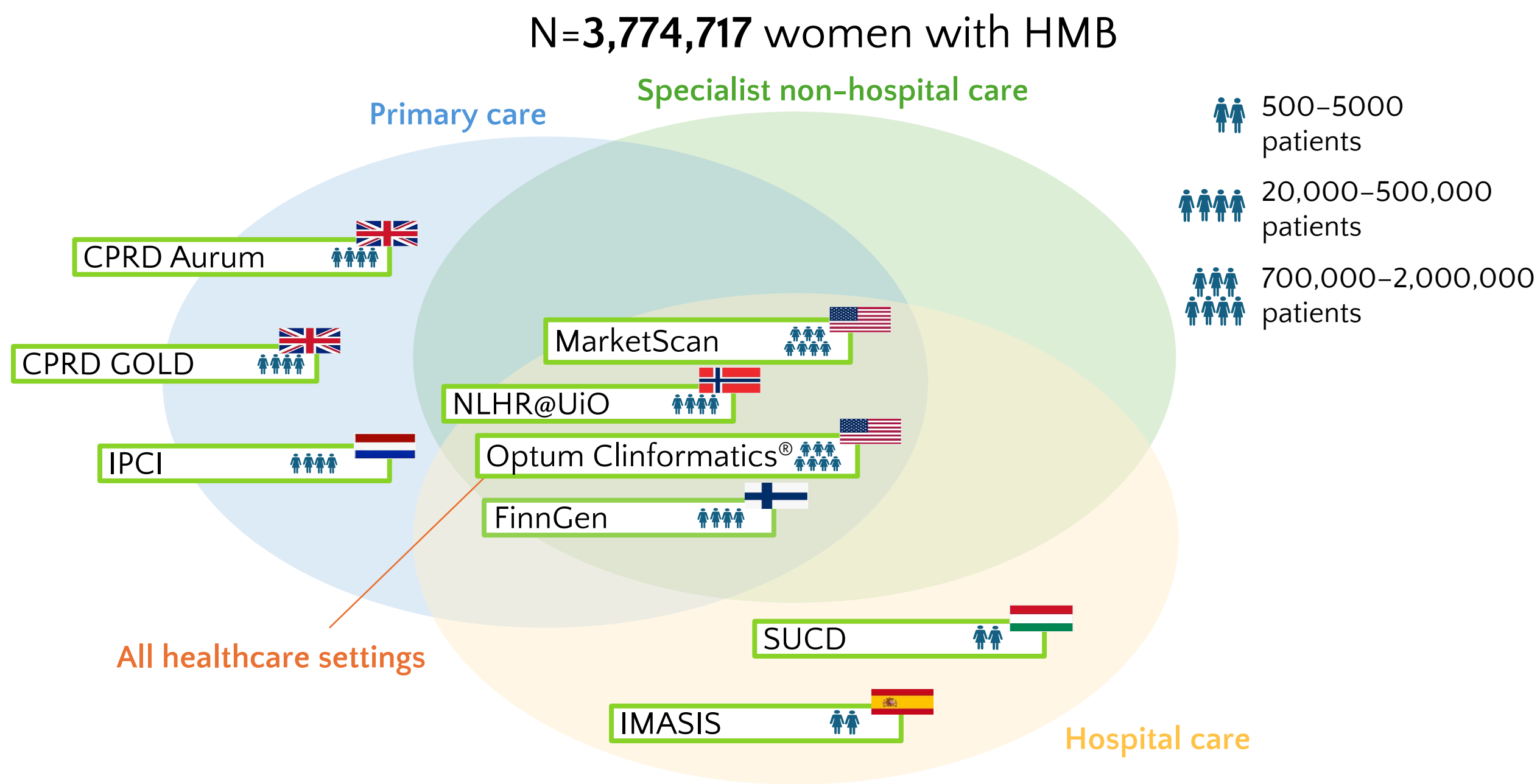
Incidence of heavy menstrual bleeding and co-occurring conditions from almost 4 million women from 7 countries across Europe and North America: Final results from a European Health Data & Evidence Network (EHDEN) study

Background: Heavy menstrual bleeding (HMB), defined as excessive menstrual blood loss, is an underrecognized disorder with significant impact on women’s quality of life.¹⁻³ Given the lack of universal clinical guidelines and up to 54% of women being undiagnosed and untreated, there is a need for better characterization of HMB and understanding of how it is managed in real-world settings.⁴

Methods:

- Descriptive, retrospective, observational cohort study
- 9 databases from 7 countries covering different healthcare settings, standardized to the OMOP CDM (Figure 1)
- Study period: 2000–2023
- Inclusion criteria:
 - ✓ Women aged 11–55 years at first HMB diagnosis between 2000–2023 (index)
 - ✓ ≥1 year of continuous observation pre-index
- Exclusion criteria:
 - ✗ Hysterectomy, bilateral oophorectomy, menopause, and uterine or ovarian cancer any time pre-index
 - ✗ Postcoital bleeding ≤1 year pre-index, and/or pregnancy ≤180 days pre-index

Figure 1: Data sources and healthcare settings



Results:

- Median age at first HMB diagnosis was relatively similar across data sources, ranging from 38 to 43 years
- Median observation time pre- and post-index varied widely, ranging from 902–15,845 days pre-index to 376–3364 days post-index
- Incidence rate (IR) per 1000 person-years was lowest in hospital-only settings (0.65–1.51) and highest in all healthcare settings (7.68–25.87)
- Over time HMB IR increased in all healthcare settings but remained stable in primary care settings (Figure 2)

Figure 2: Annual incidence rates of HMB per 1000 person years

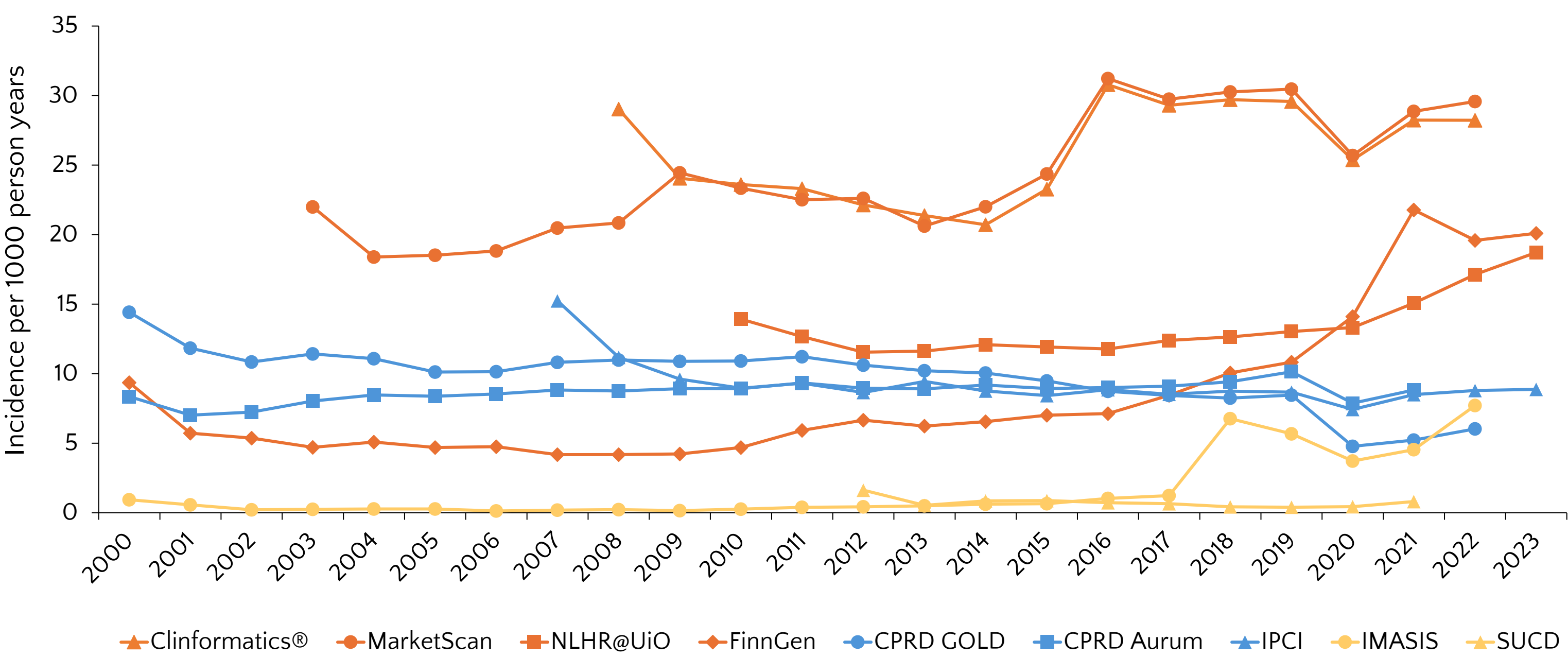
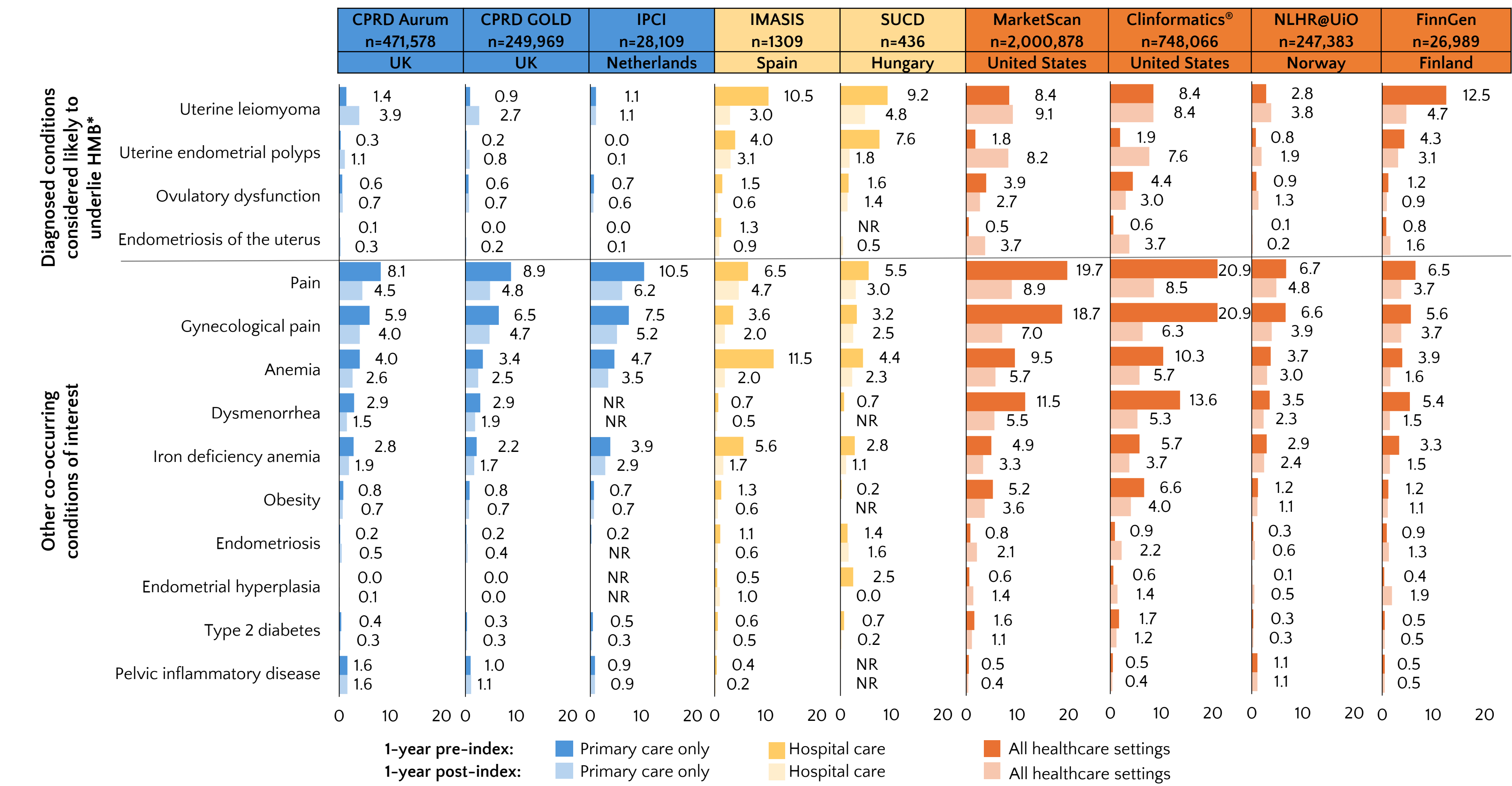


Figure 3: Co-occurring conditions 1 year pre- and post-index HMB diagnosis



1-year pre-index:

- Uterine leiomyoma was the most prevalent condition to underlie HMB, particularly in all healthcare settings (2.8–12.5%), followed by endometrial polyps (Figure 3)
- Pain (general and gynecological) was the most common condition not underlying HMB in all data sources, except Spain where anemia was most common

1-year post-index:

- Uterine leiomyoma remained prevalent (1.1–9.1%), but endometrial polyps increased >4-fold in US databases
- Most conditions decreased in prevalence post-index, but pain remained most common

Conclusions: Results from this study were strongly influenced by the healthcare setting coverage of the data sources, which may reflect variation in the management of HMB. Overall, leveraging the EHDEN federated network, with data sources harmonized to the OMOP CDM, enables the generation of comprehensive standardized evidence across diverse populations, countries, and healthcare settings.



Abbreviations: Optum Clinformatics®, Optum’s de-identified Clinformatics® Data Mart Database (Eden Prairie, MN); CPRD, Clinical Practice Research Datalink; DA, Disease Analyzer; EHDEN, European Health Data and Evidence Network; HMB, heavy menstrual bleeding; IMASIS, Institut Municipal d’Assistència Sanitària Information System; IPCI, Integrated Primary Care Information; IR, incidence rate; NLHR@UiO, Norwegian Linked Health Registry at University of Oslo; NR, not recorded; OMOP CDM, Observational Medical Outcomes Partnerships common data model; PALM-COEIN, polyp, adenomyosis, leiomyoma, malignancy and hyperplasia-coagulopathy, ovulatory dysfunction, endometrial, iatrogenic, and not yet classified; SUCD, Semmelweis University Clinical Data; UK, United Kingdom.

Marta Pineda-Moncusí¹, George Argyriou², Zsolt Bagyura³, Gianmario Candore⁴, Carina Dinkel-Keuthage⁴, Saeed Hayati⁵, Ronald Ferney Herrera Clavijo⁶, Juho Immonen⁷, Loretta Zsuzsa Kiss³, Angela Leis⁸, Miguel-Angel Mayer⁸, Carsten Möller⁴, Juan Manuel Ramírez Anguita⁸, Nhung TH Trinh⁵, Siir Su Saydam⁴, Mariana Schiffer Acar⁹, Hedvig Nordeng⁵, Katia Verhamme¹⁰, Katrin Manlik⁴

¹University of Oxford, UK; ²EPAM Systems Inc., Newtown, USA; ³Semmelweis University, Budapest, Hungary; ⁴Bayer AG, Berlin, Germany; ⁵University of Oslo, Norway; ⁶Boehringer Ingelheim International GmbH, Rhein, Germany; ⁷Bayer Oy, Espoo, Finland; ⁸Hospital del Mar Research Institute, Barcelona, Spain; ⁹Bayer CC AG, Basel, Switzerland; ¹⁰Erasmus University, Rotterdam, Netherlands

This study was funded from the Innovative Medicines Initiative 2 Joint Undertaking (IU), grant agreement No.806968. IU support from the EU Horizon 2020 research & innovation programme and the European Federation of Pharmaceutical Industries and Associations. All authors contributed to development of the abstract and maintained control over final content. No honoraria or payments were made for authorship. Data access and analysis of Norwegian data were funded by the Pharmacoeconomics and Drug Safety research group at the University of Oslo, Norway. Ethical approval for the Norwegian data in this study was obtained from The Regional Committee for Research Ethics (approval number: 155294) and the Data Protection Officer at the University of Oslo (approval number: 523275). We want to acknowledge the participants and investigators of the FinnGen study. The FinnGen project is funded by two grants from

Business Finland (HUS 4685/31/2016 and UH 4386/31/2016) and the following industry partners: AbbVie Inc., Alnylam Pharmaceuticals, Inc., AstraZeneca UK Ltd., Bayer AG, Biogen MA Inc., Boehringer Ingelheim International GmbH, Bristol Myers Squibb Inc. (and Celgene Corporation & Celgene International II Sàrl), Genentech Inc., GlaxoSmithKline Intellectual Property Development Ltd., Johnson&Johnson Innovative Medicine Inc., Maze Therapeutics Inc., Merck Sharp & Dohme LLC, Novartis AG, Pfizer Inc. and Sanofi US Services Inc. Medical writing support was provided by Kay Hallam, of Avalere Health Ltd., and was funded by Bayer. CC, CD-K, JJ, CM, SSS, MSA, and KM are/were full-time employees of Bayer at the time of the study and may hold Bayer stock or stock options. All other authors report no conflicts of interest.

References:
1. Munro MG, et al. *Int J Gynaecol Obstet.* 2018;143:393–408.
2. Weyand AC, et al. *J Pediatr.* 2022;240:171–6.
3. Pouralroudbaneh S, et al. *Int J Gynecol Obstet.* 2024;167:16–41.
4. Da Silva Filho AL, et al. *Eur J Contracept Reprod Health Care.* 2021;26:390–8.
5. Munro MG, et al. *Int J Gynaecol Obstet.* 2011;113:3–13.

