

UTILIZATION OF BLOODWORK AND ROUTINE MEDICAL VISITS IN THE US GENERAL POPULATION: ANALYSIS OF THE OPTUM CLAIMS DATABASE

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Introduction & Objectives

- Regular preventative health screening, including blood testing, allows healthcare providers to monitor patients' health by evaluating cardiovascular risk, diagnosing disease or infection, assessing the effect of medications, and checking organ function¹
- Screening enables the early diagnosis and treatment of many medical conditions with the goal of more timely therapeutic interventions, improving patients' quality of life, reducing treatment costs, and preventing premature death for more acute conditions²
- This study assessed the utilization of routine bloodwork and routine medical visits among the US population to better characterize real world utilization patterns using a validated and generalizable claims dataset

Methods

- Eligible patients (≥18 years) had ≥28 months of continuous medical benefits between November 2017 – February 2020 in Optum's de-identified Clinformatics® Data Mart Database
- Optum's Clinformatics® Data Mart (CDM) is derived from a database of administrative health claims for members of large commercial and Medicare Advantage health plans³
- Patients were evaluated in cross-sectional analysis of entire 2019 dataset for routine visits and bloodwork, and cohorts were established:
 - Patients with routine bloodwork and a routine visit
 - Patients with no routine bloodwork, with routine visit
 - Patients with routine bloodwork, with no routine visit
 - Patients with no routine bloodwork and no routine visit
- Routine bloodwork was defined as occurring within the 60-day look back or look forward periods from a routine visit (≥1 medical claim for an annual visit)
- Comorbidities of interest were identified in the 12 months prior to and including index date (List of ICD codes for comorbidities can be viewed by scanning the QR code on the bottom right side)

Table 1 | Cohort Definitions and CPT Codes

Type	Procedure	CPT Code	
Routine Visit	Annual Routine Physical that includes blood work	99385 - 99387 99395 - 99397	
	Annual Wellness Visit	G0438 G0439	
Routine Bloodwork	Complete Blood Count (CBC)	85025 85027 85007	
		Complete Metabolic Panel (CMP)	80047 80048 80053
			CBC+CMP (general health panel)

Table 2 | Patient Demographics

	Overall
Sample Size (n)	9,784,012
Age in years, Mean (SD)	56.4 (19)
Female Gender, n (%)	5,376,173 (55%)
Race and Ethnicity, n (%)	
White	7,124,398 (76%)
African American	552,165 (6%)
Asian	361,056 (4%)
Hispanic	857,601 (9%)
Unknown or missing	498,869 (5%)
Rural/Urban, n (%)	
Rural	362,216 (4%)
Urban	9,300,874 (96%)
Insurance Type, n (%)	
Private/ Commercial	6,407,513 (66%)
Medicare Advantage	3,376,499 (35%)

Table 3 | Cohort Distribution

	Bloodwork	No Bloodwork	Total
Routine Visit	34%	14%	48%
No Routine Visit	31%	21%	52%
Total	65%	35%	9,784,012 (100%)

Table 4 | Physician Specialty Information at Routine Visit (physicians who saw patients who had routine visit) and at Bloodwork (physicians who ordered bloodwork for patients who had bloodwork)

	Overall Patients with Routine Visit	Overall Patients with Bloodwork
Sample Size (n)	4,738,369	6,311,256
Physician Specialties, n		
Family Practice	1,837,439 (38.8%)	Family Practice 2,275,957 (36.1%)
Internist	1,417,641 (29.9%)	Internist 1,284,645 (20.4%)
OB/GYN	841,279 (17.8%)	Lab 1,028,559 (16.3%)
Other Specialty	247,192 (5.2%)	Hospital 500,299 (7.9%)
Other	65,530 (1.4%)	OB/GYN 330,569 (5.2%)
Hospital	42,540 (0.9%)	Other Specialty 287,877 (4.6%)

Results

Figure 1 | Overview of All Patients with Routine Visit (Cohorts 1 and 2) and All Patients with Bloodwork (Cohorts 1 and 3)

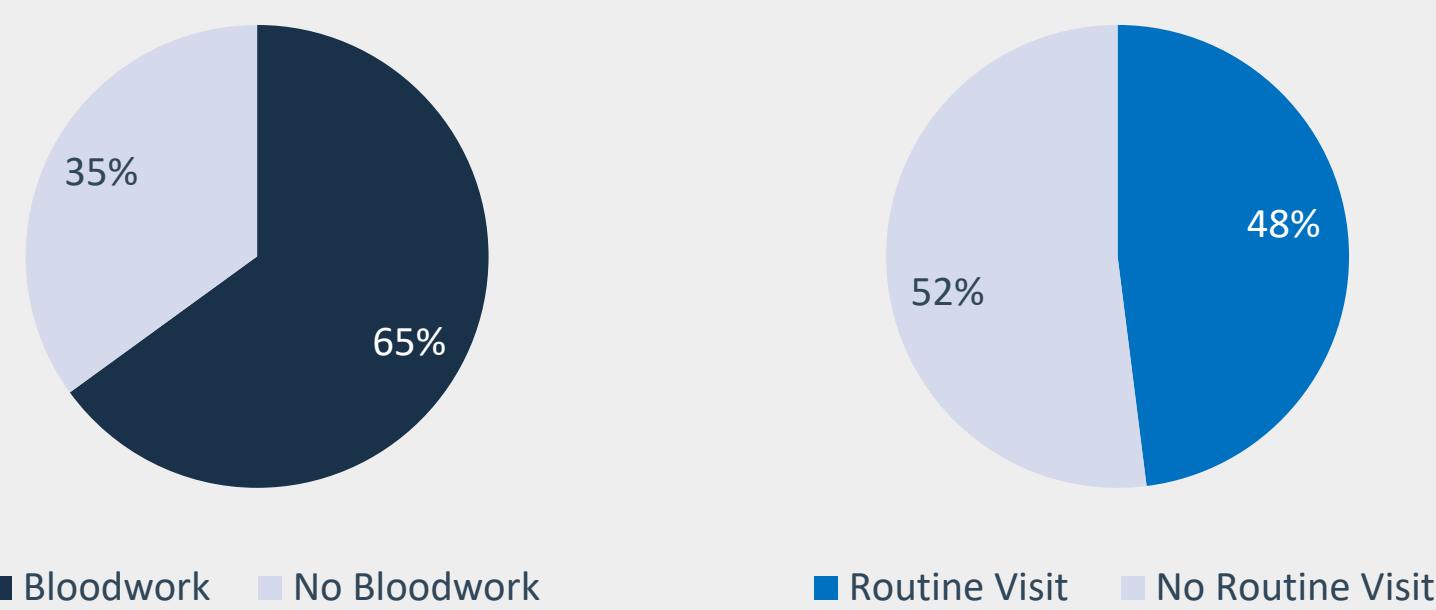


Figure 2 | Patient Cohorts Across Age Groups

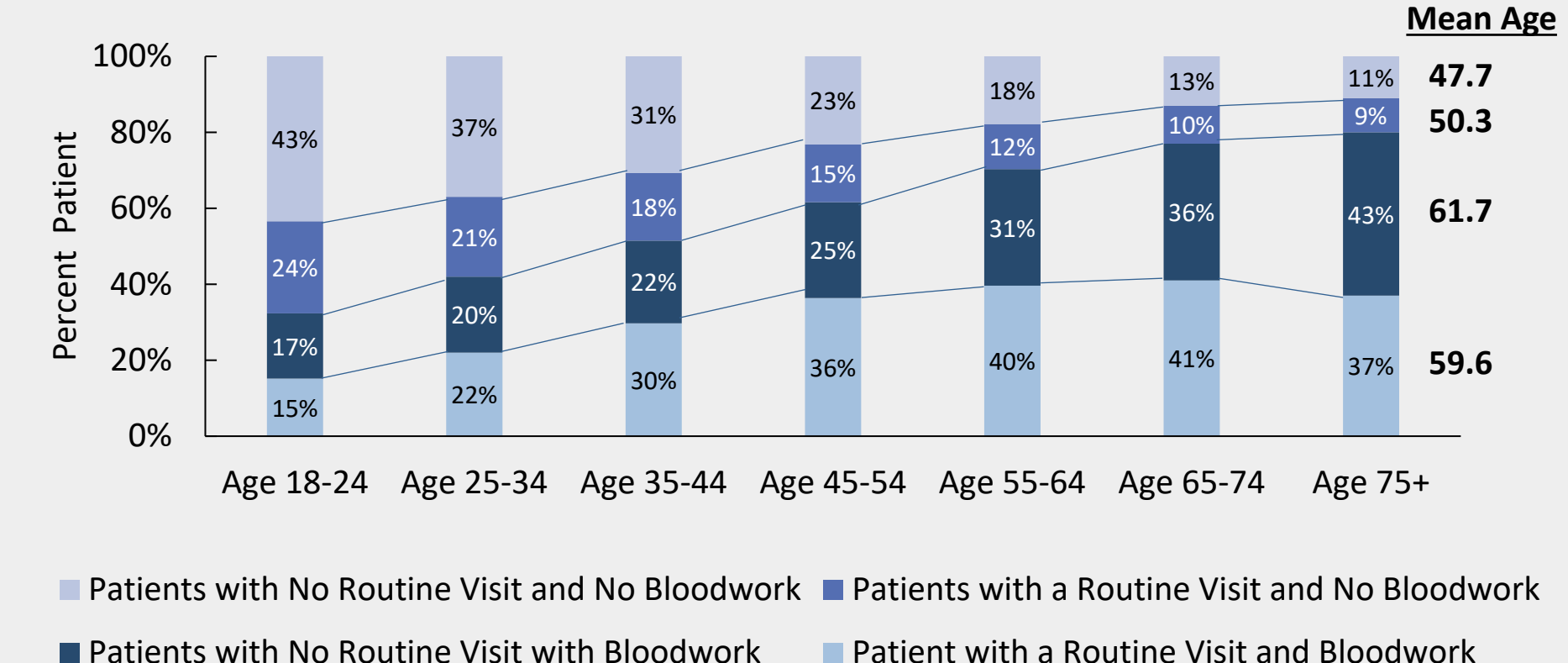


Figure 3 | Overall Patient Clinical Information and Charlson Comorbidity Index across Age Groups

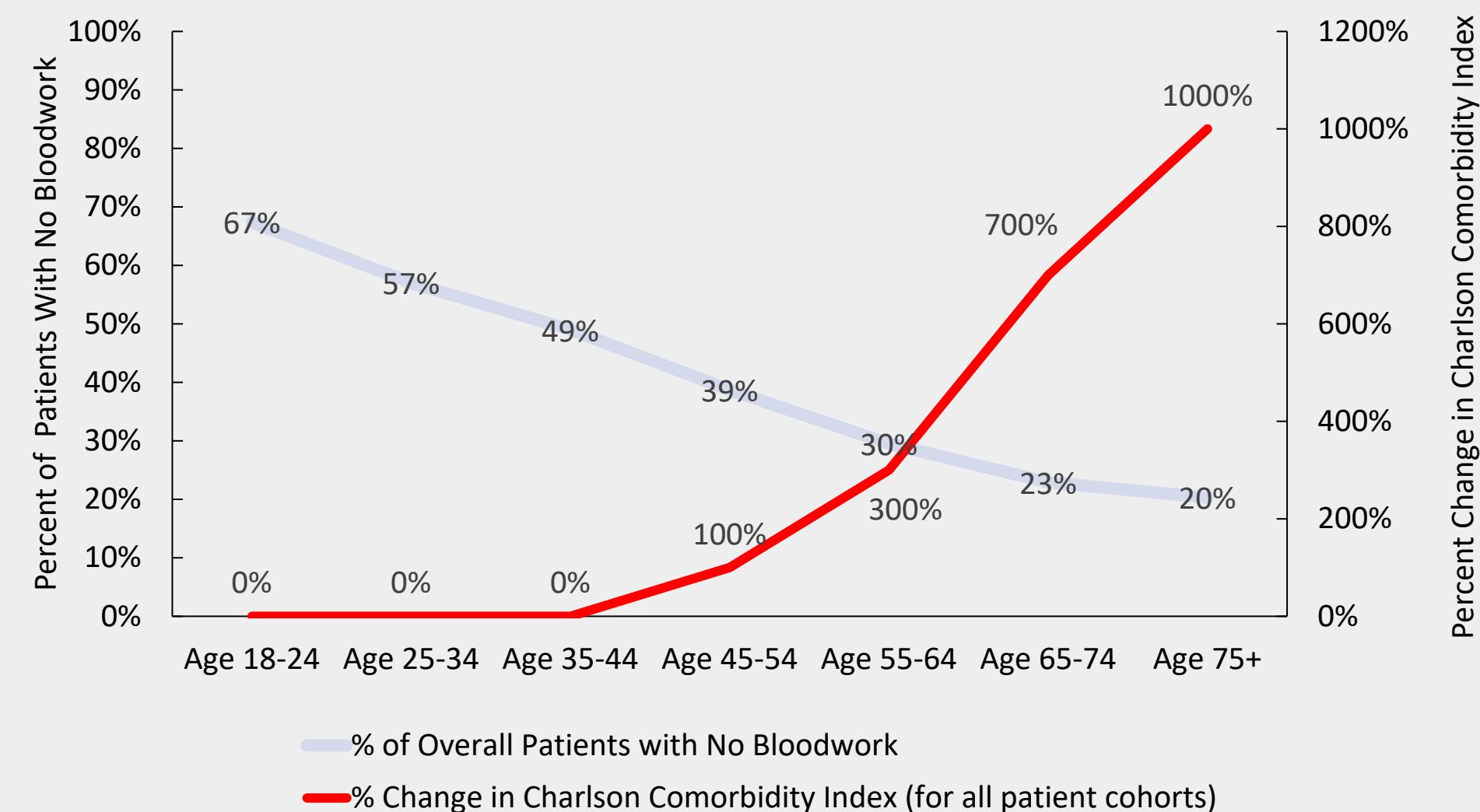


Figure 4 | Comorbidities That May be Evaluated Through Blood Testing Across Cohorts

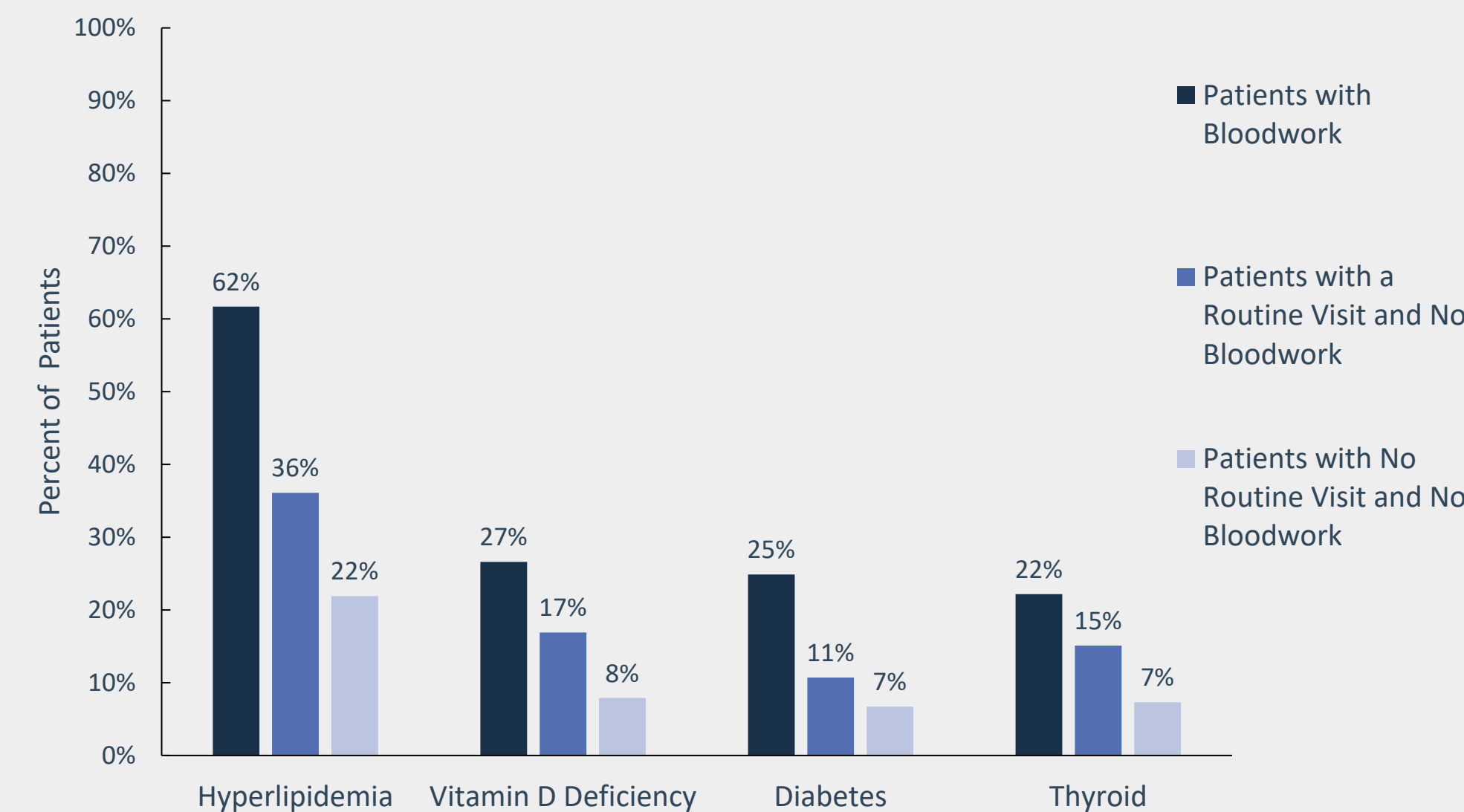
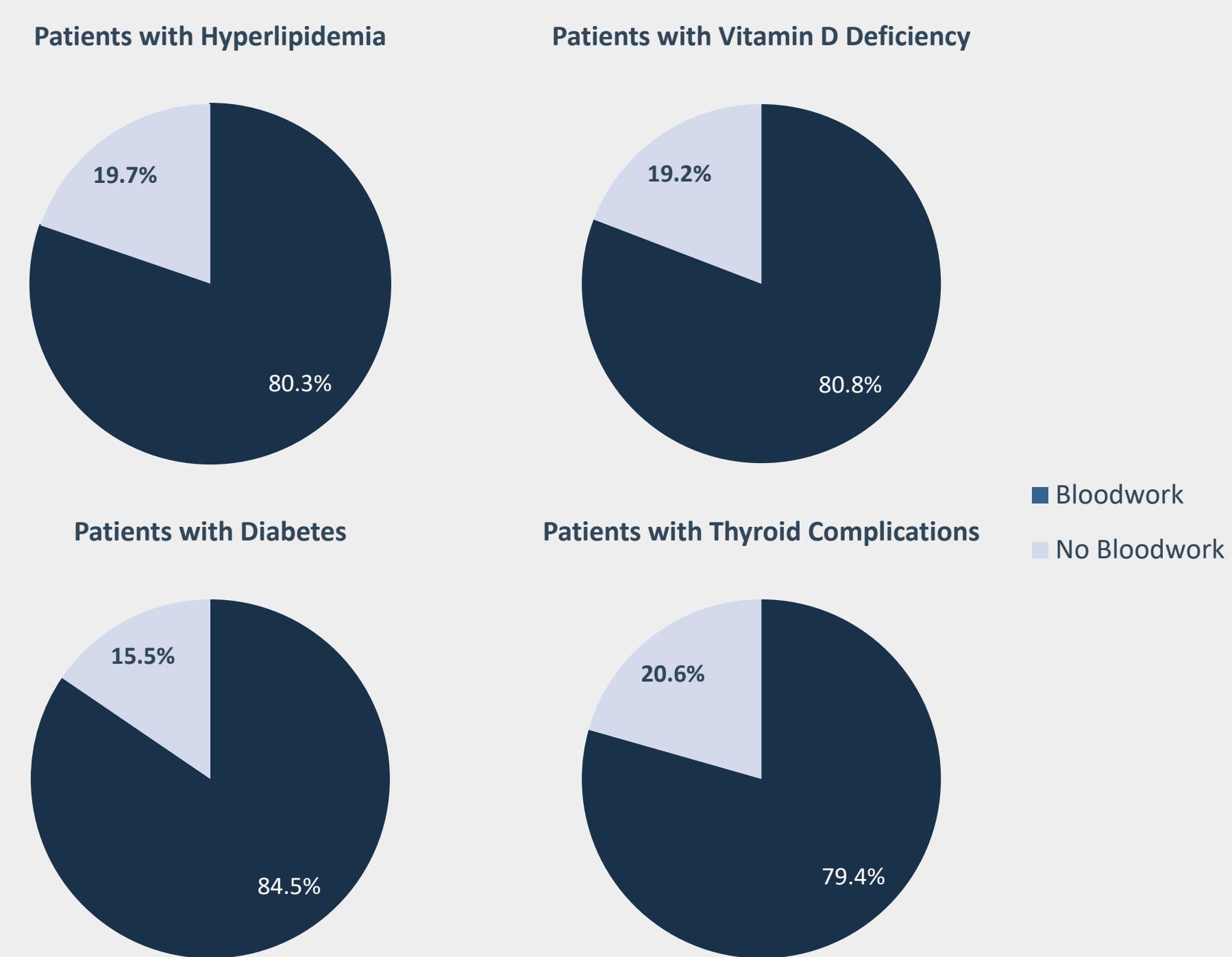


Figure 5 | Comorbidities That May be Evaluated Through Blood-based Testing Across Bloodwork/Non-bloodwork Groups



Discussion:

- This research on the utilization of routine bloodwork and medical visits among the US population contributes to a better understanding of current practice, and is unique in its contribution to recent scientific literature as the trends from this analysis are expected to be consistent for the general US population
- Lack of routine blood testing could delay diagnosis or treatment of diseases and health outcomes which have significant cost and burden to patients and the healthcare system
- Notably, there is an inflection point of increasing comorbidity burden in the critical age range of 35-64 years where early access to preventative blood testing could help long-term patient outcomes
- Many patients have comorbidities requiring routine blood-based testing, indicating a need for more frequent or more easily accessible blood-based testing

Limitations:

- This cross-sectional study cannot prove that higher utilization of blood-based testing leads to better patient outcomes due to the limitations of study design; a high-powered longitudinal study is necessary to prove this association
- This analysis took a broad approach to identifying conditions and diagnoses requiring routine blood-based testing, which could lead to overestimating qualifying conditions; future analyses should investigate conditions specific to blood-based testing in more depth
- Additionally, this analysis has no visibility into true patient non-compliance i.e., physicians ordering unfilled blood-testing or the underdiagnosis of comorbidities in patients who did not have routine annual visits
- Selection bias may also be a factor given this analysis includes only patients with insurance coverage and may not be representative of the general US population
- Misclassification bias could occur with retrospective data; claims data can be susceptible to this as they are used for billing purposes

Conclusions:

- More than one in five patients in the US (21%) do not receive routine bloodwork and routine primary care visits
- A lack of preventative care could lead to increased comorbidity incidence for several disease categories, possibly as a result of delayed diagnosis or treatment; which may, in turn, lead to worse clinical outcomes and increased healthcare utilization and costs
- Further work is required to determine the overall impact of increased availability for blood collection at primary care or other healthcare settings in the US to help improve patient health through preventative care

References

- Blood Tests, NIH, National Heart, Lung, and Blood Institute, <https://www.nhlbi.nih.gov/health/blood-tests>
- Iragorri, N., & Spackman, E. (2018). Assessing the value of screening tools: reviewing the challenges and opportunities of cost-effectiveness analysis. Public health reviews, 39(1), 1-27
- Optum's de-identified Clinformatics® Data Mart Database (2007-2021)

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E-poster



ICD Code List