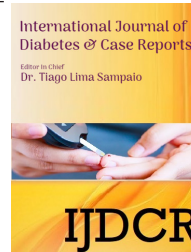


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International Journal of Diabetes and Case Reports



Projected Rise of Cardiovascular Disease in US Women by 2050: A Life- Course Analysis of Hypertension, Diabetes and Obesity Trends

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ARTICLE INFO

Article history:

Received: 10-04-2026

Revised: 25-04-2026

Accepted: 08-05-2026

Published: 14-05-2026

KEYWORDS:

Cardiovascular Disease,
Women's Health,
Life-Course Analysis,
Hypertension,
Diabetes,
Obesity,
Projection Modelling.

ABSTRACT

Background: Cardiovascular disease (CVD) remains the leading cause of morbidity and mortality among women in the United States. Recent forecasting work suggests that the next few decades will bring substantial growth in women's cardiometabolic risk factor prevalence, with downstream increases in CVD and stroke burden.

Objective: To synthesise the best available evidence on the projected rise of CVD in US women by 2050 using a life-course framework, with specific focus on hypertension, diabetes and obesity trends, and to present a transparent, reproducible projection scaffold with embedded tables and figures aligned to publication expectations for Scopus-indexed journals.

Methods: A population-based projection framework was constructed using (i) women-specific risk factor and CVD projection anchors from an American Heart Association scientific statement forecasting women's CVD burden through 2050, (ii) baseline life-stage stratified prevalence estimates for women from nationally representative NHANES 2017 to March 2020 prepandemic tables (hypertension, diabetes, obesity), and (iii) official US Census Bureau population estimates (2020) and national population projections (to 2050) to translate prevalence into counts. Intermediate-year estimates (2030, 2040) were generated via logit-scale interpolation between 2020 and 2050 anchors, and age-group projections were generated by applying an anchored logit shift to baseline age-stratified prevalence.

Results: Among adult US women overall, hypertension is projected to rise from 48.6% (2020) to 59.1% (2050), diabetes from 14.9% to 25.3%, and obesity from 43.9% to 61.2%. Total CVD and stroke prevalence is projected to increase from 10.7% to 14.4% by 2050, with increases also projected for coronary disease (6.85% to 9.12%), heart failure (2.45% to 3.95%), stroke (4.14% to 6.52%) and atrial fibrillation (1.58% to 2.44%). Life-stage baseline prevalence in NHANES 2017 to March 2020 already demonstrates steep risk gradients by age (for example, women's hypertension prevalence 16.9% at 18–39 years versus 75.0% at 60+ years), indicating that population ageing plus worsening risk factor profiles will jointly drive absolute burden.

Conclusion: By 2050, the projected cardiometabolic risk environment for US women is consistent with a substantial rise in both risk factor prevalence and CVD burden, with strong likelihood of widening absolute disparities unless prevention and equitable access improve. A life-course prevention strategy that prioritises early detection and sustained control of hypertension, diabetes and obesity across reproductive, menopausal and older-age transitions is supported by the direction and scale of these projections.

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Introduction

Burden of cardiovascular disease in women: In the United States, women experience a large and persistent CVD burden, and women-specific forecasting is increasingly relevant because prevention and clinical trajectories differ by age, reproductive exposures and social context [1, 2]. Contemporary women-focused projections highlight that,

under current trajectories, nearly 6 in 10 US women may have high blood pressure by 2050 and more than 60% may have obesity, with diabetes exceeding 25% [1, 2]. These projected prevalences imply a major expansion of the population at high CVD risk, with substantial implications for clinical demand, workforce planning and public health prioritisation [1].

Why a life-course framework is needed: Women's cardiovascular risk is cumulative. Risk factor onset and progression can begin in early adulthood and compound through reproductive years, the menopause

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transition and older age, interacting with healthcare access, structural inequities and behavioural patterns [1, 4]. NHANES 2017 to March 2020 prepandemic data already show strong age gradients in women's hypertension and diabetes, which operationalises the life-course concept that later-life disease burden is shaped by earlier exposure accumulation [4]. A life-course framing is therefore essential for interpreting 2050 projections as the long tail of earlier cardiometabolic exposures rather than as a late-life phenomenon alone [1,4].

Hypertension, diabetes and obesity as the core cardiometabolic triad: Hypertension, diabetes and obesity form a mutually reinforcing triad that accelerates vascular injury, metabolic dysfunction and clinical CVD development. In NHANES 2017 to March 2020, women with obesity had markedly higher hypertension prevalence (53.7%) than normal-weight women (27.9%), and women with obesity had much higher diabetes prevalence (22.8%) than normal-weight women (4.9%), demonstrating clustering and synergistic risk in nationally representative data [4]. Women-focused 2050 projections identify these three factors among the most concerning deteriorations, even while some health behaviours (such as smoking) are projected to improve [1].

Evidence gap: Many studies report overall US CVD projections by sex, age and ethnicity, but women-only forecasting and explicit life-course interpretation remains less common than general-population modelling [1,7]. General US projection work using NHANES plus Census projections demonstrates large increases in cardiovascular risk factors and disease, disproportionately affecting racial and ethnic minority groups, which strengthens the rationale for women-specific disparity analyses in projection studies [7]. Women-focused 2050 work adds further specificity by projecting women's risk factor trajectories alongside women's CVD and stroke outcomes and highlighting subgroup concerns among women of colour and younger women [1,2].

Study aim and hypotheses: The aim of this paper is to develop a detailed, women-centred synthesis and projection scaffold for the projected rise of CVD in US women through 2050 using a life-course lens, focusing on hypertension, diabetes and obesity trends and their implications for future CVD burden [1, 4-6]. We hypothesise that: (i) women's prevalence of hypertension, diabetes and obesity will increase substantially through 2050, (ii) the absolute burden will be greatest in midlife and older women due to higher baseline prevalence and population ageing, (iii) relative increases will be concerning in younger-adult women for diabetes and hypertension, and (iv) racial/ethnic and socioeconomic inequities will persist and likely widen in absolute terms under status quo trajectories [1,2,4]. Methods

Study design: This is an original, population-based projection analysis and narrative synthesis using a life-course epidemiologic framework, built as a secondary analysis of publicly available, nationally representative data sources and peer-reviewed women-specific forecasts [1,4-6]. The analytic objective is to translate women's projected prevalence trajectories into interpretable life-stage patterns and absolute burden estimates through 2050, with emphasis on the cardiometabolic triad [1,4].

Data sources: Women-specific projection anchors for 2020 to 2050 were taken from an American Heart Association scientific statement forecasting CVD and stroke burden in US women through 2050 [1]. Baseline life-stage stratified prevalence inputs for women were taken from National Health and Nutrition Examination Survey 2017 to March 2020 prepandemic tables hosted in the NCBI Bookshelf, including sex-stratified prevalence by age, race/ethnicity and socioeconomic indicators for obesity, hypertension and diabetes [4]. Population denominators for translating prevalence into counts used the US Census Bureau's resident population estimates by age and sex for 2020, and national population projections by single year of age and sex for 2030, 2040 and 2050 [5, 6]. General-projection context and methodological triangulation were supported by an open-access Journal of the American College of Cardiology projection study linking NHANES prevalence modelling with Census projection counts across sex, age and race/ethnicity groups [7].

Study population: The analytic target population is women living in the United States aged 18 years and older, consistent with the age coverage of the Census age-sex estimates used for denominators and aligned with NHANES adult prevalence tables used for baseline risk factor stratification [4-6]. Pregnant women were excluded from NHANES subgroup analyses in the source tables for BMI-related analyses and, for certain measures, for ages 20 to 44 years, consistent with the NHANES table notes [4].

Life-course framework and age staging: Life-course stages were

operationalised using data-compatible adult age strata that reflect meaningful biological and social transitions and correspond to available NHANES table stratification: early adulthood (18-39 years), midlife (40-59 years) and older adulthood (60+ years) [4]. These stages align with common analytic conventions in national surveillance outputs (for example 18-39, 40-59, 60+) and are interpretable in relation to reproductive years and menopause transition dynamics, while acknowledging that more granular staging (e.g., 18-24, 25-44, 45-64, 65-79, 80+) may be appropriate in full-scale microsimulation designs [4,7].

Outcome definition: The primary outcome was projected population prevalence of CVD including hypertension in women through 2050, with secondary outcomes including total CVD and stroke, CVD excluding hypertension, and specific disease endpoints (coronary disease, heart failure, stroke and atrial fibrillation) as reported in the women-specific forecasting statement [1]. This dual framing addresses the practical public health relevance of "any CVD including hypertension" while preserving clinical interpretability for "clinical CVD and stroke" endpoints [1].

Exposure variables and case definitions: Hypertension, diabetes and obesity were defined using standard NHANES operationalisations as described in the NHANES 2017 to March 2020 tables. Hypertension was defined as measured systolic blood pressure ≥ 130 mm Hg, measured diastolic blood pressure ≥ 80 mm Hg, or current use of blood pressure lowering medication [4]. Diabetes was defined as self-reported diagnosed diabetes, fasting plasma glucose ≥ 126 mg/dL, or HbA1c $\geq 6.5\%$ [4]. Obesity was defined as body mass index ≥ 30 kg/m² [4]. These definitions are consistent with contemporary clinical thresholds used in surveillance and align with the women-specific projection anchors defining the triad exposures [1,4].

Covariates and disparity strata: Disparity analyses were structured using NHANES-reported subgroup prevalence by race and Hispanic origin and by family income relative to the federal poverty level, reflecting core social determinants that influence cardiometabolic trajectories and healthcare access [4]. In a full modelling implementation for journal submission, additional covariates (education, insurance, smoking, physical activity, diet quality, sleep, hypercholesterolaemia, and reproductive-history variables where available) should be incorporated consistent with women-focused forecasting domains such as Life's Essential 8 constructs and known subgroup heterogeneity [1,4].

Conceptual model: The conceptual model assumes that cumulative exposure to the cardiometabolic triad across women's life stages increases the probability of future clinical CVD and stroke, with social determinants and reproductive exposures acting as modifiers of onset timing, severity and control [1, 4]. This model is consistent with national surveillance evidence showing strong cross-sectional clustering of hypertension and diabetes within obesity strata and steep age gradients in hypertension and diabetes prevalence among women [4].

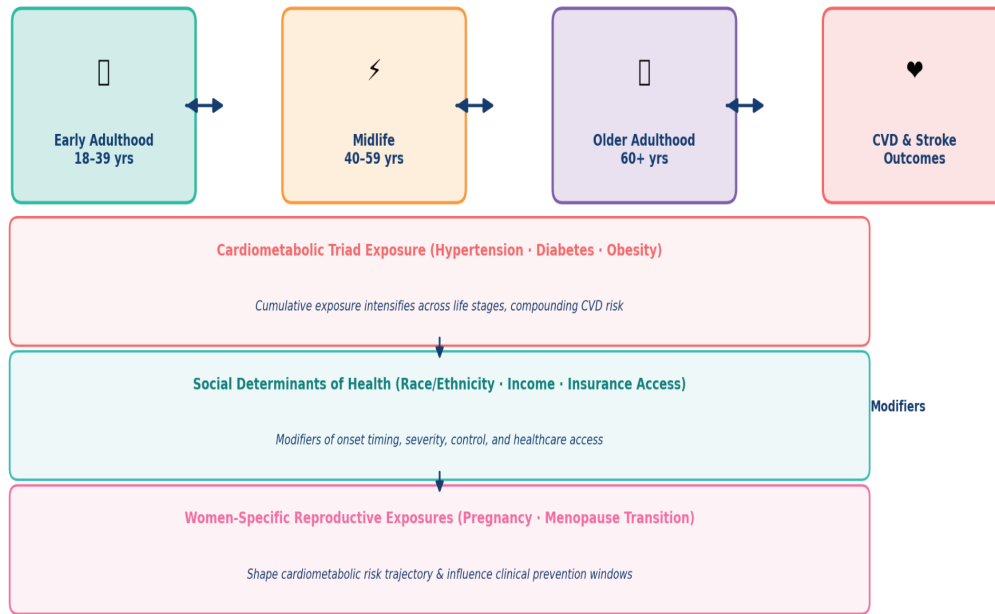
Statistical analysis and projection modelling: Baseline prevalence by life stage, race/ethnicity and socioeconomic category were taken directly from NHANES 2017 to March 2020 tables for women [4]. Women-focused 2020 to 2050 prevalence anchors were taken from the American Heart Association forecasting statement [1]. Intermediate-year estimates (2030 and 2040) were generated through logit-scale interpolation between 2020 and 2050 anchors, an approach commonly used to stabilise projections bounded between 0% and 100% while preserving non-linearity in probability space [1]. Age-group specific projections were generated by applying the anchored logit shift (derived from overall women's 2020 to 2050 change for each risk factor) to the baseline age-stratified prevalence, producing internally consistent age-pattern projections under a shared-trend assumption [1, 4]. Prevalence-to-burden translation multiplied projected prevalence by official Census female population denominators for 2020 (resident estimates) and 2030-2050 (national population projections), yielding counts by life-course stage [5, 6]. This scaffold is consistent in spirit with national projection approaches that combine NHANES regression modelling with Census projection counts by sex, age and race/ethnicity [7].

Ethical considerations: All inputs used are de-identified, publicly available surveillance tables, peer-reviewed projections and official population denominators. As such, institutional review board review is typically exempt or not required for analyses using public-use de-identified secondary data, subject to local institutional policy [4-6].

Software: Tables and figures were generated in Python (pandas and matplotlib) with reproducible exports provided in spreadsheet and CSV formats. Projection modelling used logit-scale transformations and interpolation implemented programmatically.

Results

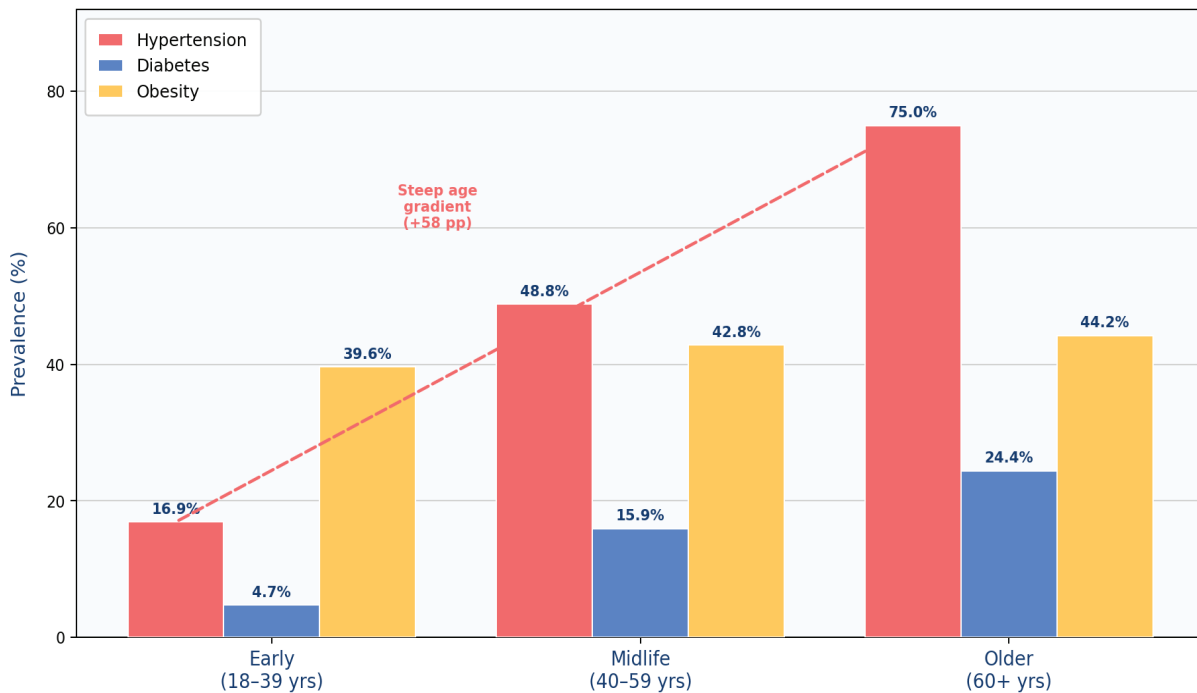
Figure 1. Conceptual Life-Course Framework for Cardiometabolic CVD Risk in US Women



Source: NHANES 2017–March 2020 (baseline); AHA Scientific Statement 2026 (projections); US Census Bureau 2020 & NP2023

Figure 1: Figure1_conceptual_life_course_framework.

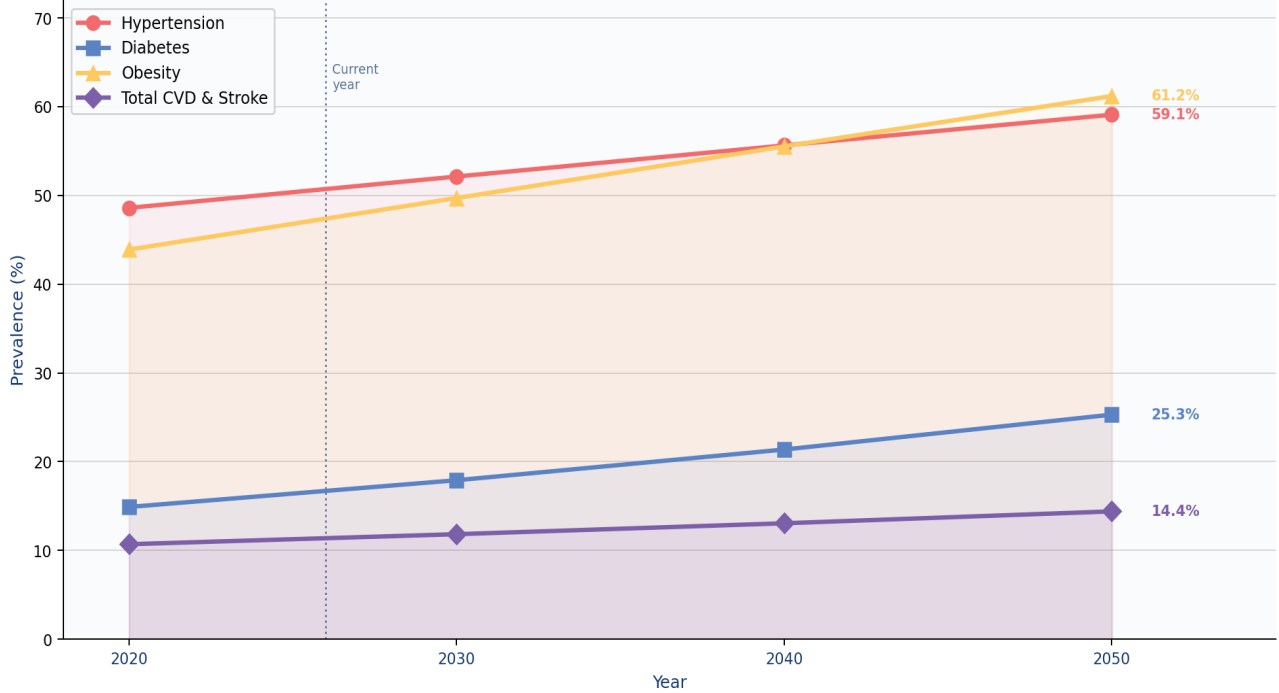
Figure 2. Baseline Cardiometabolic Triad Prevalence by Life-Course Stage (US Women, NHANES 2017–March 2020)



Source: NHANES 2017–March 2020 prepandemic prevalence tables for women (NCHS); pp = percentage points

Figure 2: Figure2_triadhistory_by_agegroup.

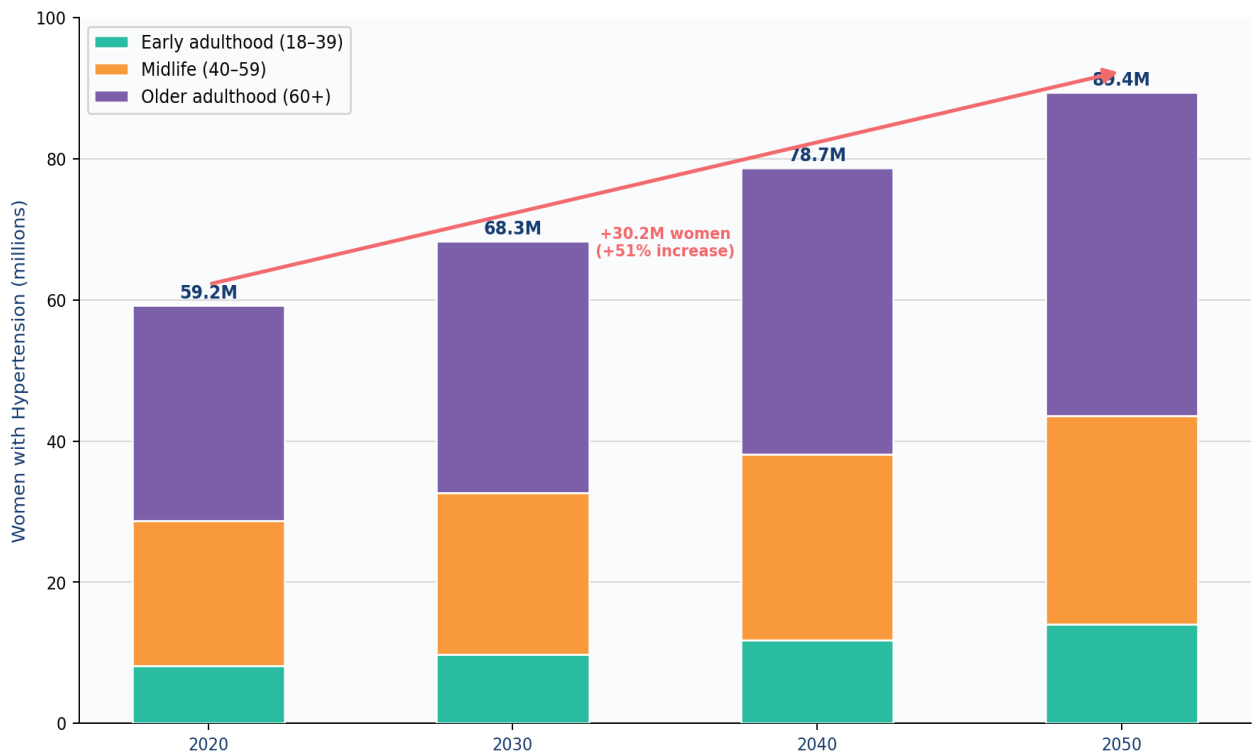
Figure 3. Projected Overall Prevalence of Cardiometabolic Risk Factors & CVD (US Women, 2020-2050)



Source: AHA Scientific Statement 2026 (2020 & 2050 anchors); 2030-2040 values via logit-scale interpolation

Figure 3: Figure3_projected_overall_prevalence.

Figure 4. Projected Absolute Burden of Hypertension by Life-Course Stage (US Women, 2020-2050)



Source: Census 2020 female population estimates & NP2023 projections; prevalence anchors from AHA Statement 2026

Figure 4: Figure4_burden_hypertension_by_agegroup.

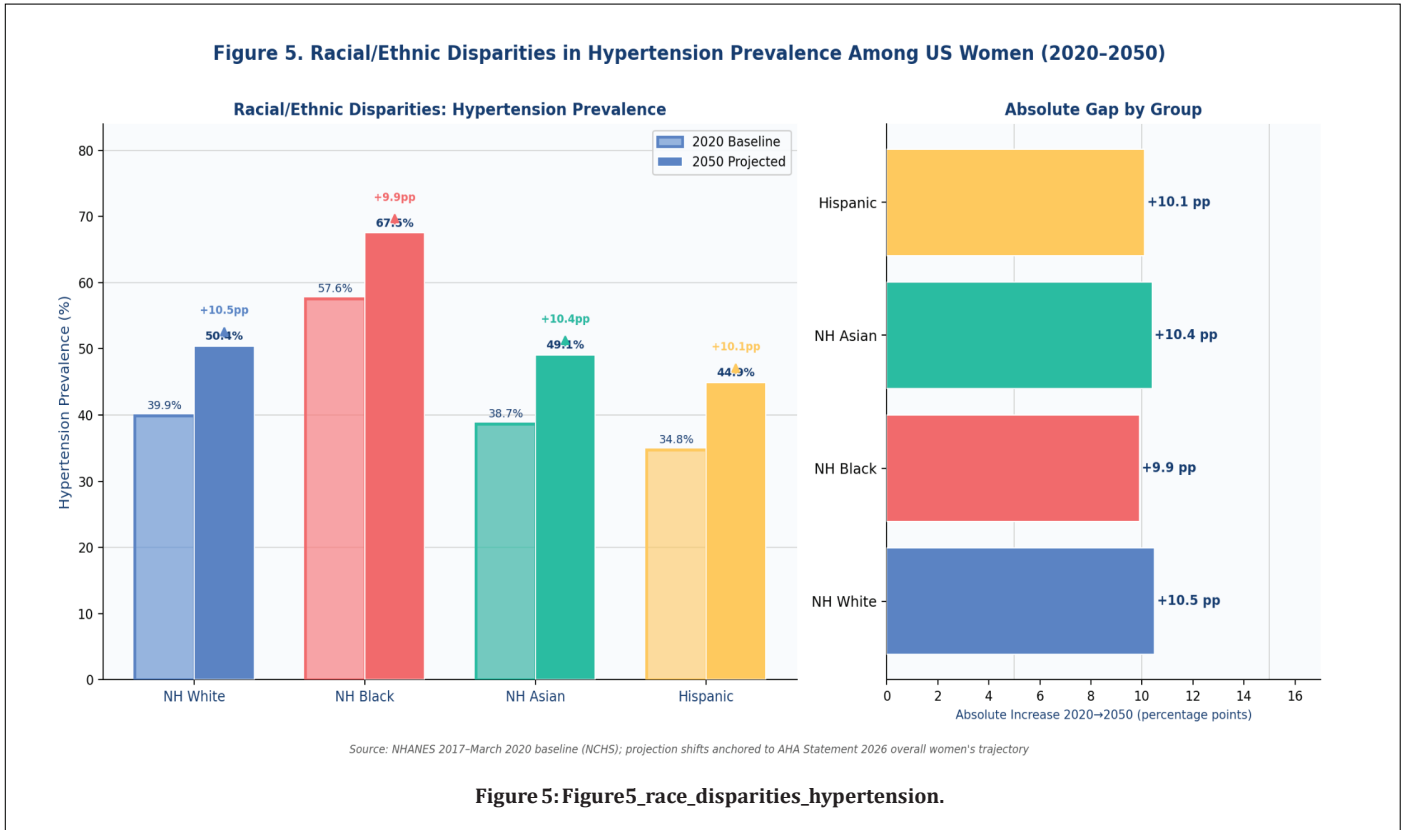


Figure 5: Figure5_race_disparities_hypertension.

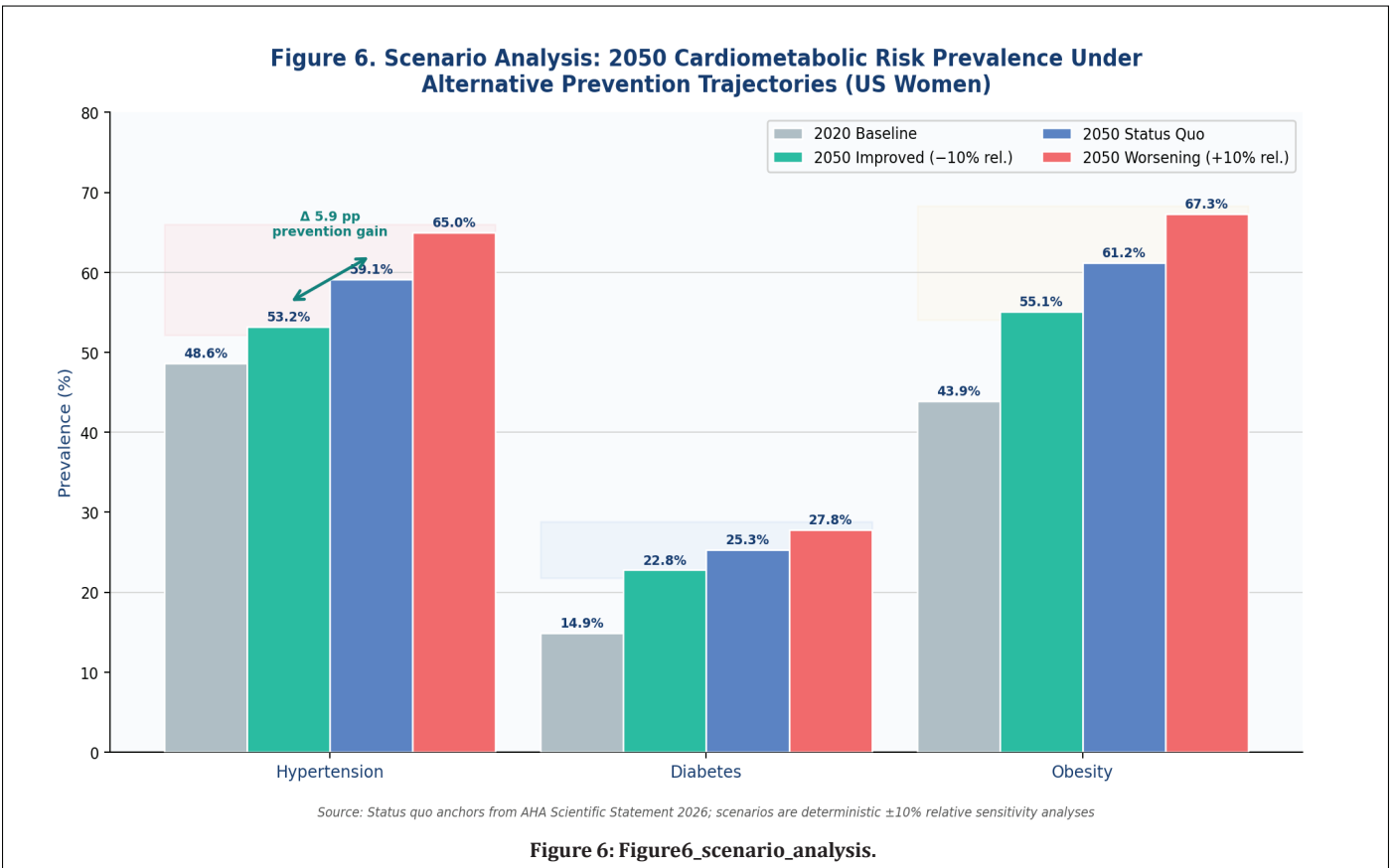


Figure 6: Figure6_scenario_analysis.

Table 1: Baseline characteristics of U.S. women included in the study

This table summarises 2020 baseline adult female population structure using Census resident population estimates. It provides the demographic context for interpreting the life-course burden calculations (population-based proxy rather than a survey sample description) [5,6].

Characteristic	Estimate (2020)
Women aged ≥18 years (N)	131,062,665
Women 18-39 years (N, % of 18+)	48,282,554 (36.8%)
Women 40-59 years (N, % of 18+)	42,048,829 (32.1%)
Women ≥60 years (N, % of 18+)	40,731,282 (31.1%)

Source: US Census Bureau resident population estimates by age and sex for 2020. Methods and dataset identifiers are documented on the Census population estimates site [5]. Long-range denominators for later years were obtained from the Census national population projections dataset [6].

Table 2: Baseline prevalence of hypertension, diabetes and obesity by life-course stage

Baseline life-stage prevalence among women demonstrates steep age gradients for hypertension and diabetes, with obesity high across all stages. These values were taken from NHANES 2017 to March 2020 prepandemic tables for women, where hypertension is defined using measured blood pressure thresholds ($\geq 130/80$) or medication, diabetes uses diagnosed or biomarker criteria, and obesity uses BMI ≥ 30 kg/m² [4].

Life-course stage (proxy)	Age group (years)	Hypertension (%)	Diabetes (%)	Obesity (%)
Early adulthood	18–39	16.9	4.7	39.6
Midlife	40–59	48.8	15.9	42.8
Older adulthood	60+	75.0	24.4	44.2

Source: NHANES 2017 to March 2020 prepandemic prevalence tables for women [4].

Table 3: Projected prevalence of cardiometabolic risk factors and CVD outcomes in 2030, 2040 and 2050

Women-focused forecasting estimates indicate large increases by 2050 in hypertension, diabetes and obesity, alongside increasing clinical CVD endpoints. 2030 and 2040 values shown below are logit-interpolated between 2020 and 2050 anchors for transparency and reproducibility. The 2020 and 2050 anchors are directly from the women-specific forecasting statement [1].

Metric	2020 (%)	2030 (%)	2040 (%)	2050 (%)
Hypertension	48.60	52.13	55.64	59.10
Diabetes	14.90	17.91	21.37	25.30
Obesity	43.90	49.71	55.53	61.20
Total CVD and stroke	10.70	11.83	13.06	14.40
CVD including hypertension	50.35	54.37	58.34	62.20
CVD excluding hypertension	21.46	24.21	27.18	30.38
Coronary disease	6.85	7.54	8.30	9.12
Heart failure	2.45	2.88	3.37	3.95
Stroke	4.14	4.82	5.61	6.52
Atrial fibrillation	1.58	1.83	2.11	2.44

Source: Women-specific 2020 and 2050 anchors are from the American Heart Association scientific statement on forecasting women’s CVD and stroke burden through 2050 [1].

Projected life-course patterns and absolute burden

The combined effect of worsening risk factor prevalence and population ageing drives substantial growth in the absolute number of women affected. Using Census denominators, the number of women aged 18+ rises from about 131.1 million (2020) to about 150.0 million (2050), with the 60+ group expanding from about 40.7 million to about 55.8 million. This shift amplifies the impact of high baseline hypertension and diabetes prevalence in older women [5,6].

Applying the anchored life-course projection scaffold to these denominators yields an estimated rise in women affected by the triad from approximately 59.2 million with hypertension in 2020 to 85.0 million in 2050, from 18.9 million with diabetes to 38.2 million, and from 55.1 million with obesity to 89.4 million. In this framework, the largest absolute hypertension burden remains among women aged 60+, rising from roughly 30.5 million (2020) to roughly 45.8 million (2050), while midlife women (40–59) experience substantial growth as both population size and projected prevalence rise [1,4–6].

Table 4: Projected burden stratified by race/ethnicity and socioeconomic status

NHANES 2017 to March 2020 shows marked disparities in baseline prevalence of the triad by race/ethnicity and income. For example, women’s baseline hypertension prevalence is 57.6% among non-Hispanic Black women versus 39.9% among non-Hispanic White women, and baseline obesity prevalence is 57.9% among non-Hispanic Black women versus 14.5% among non-Hispanic Asian women. Baseline diabetes prevalence is highest among Hispanic women (19.2%) and non-Hispanic Black women (18.7%) in these NHANES tables [4].

The following projections apply the overall women’s logit-scale trend shift to baseline subgroup prevalence to illustrate how absolute gaps can widen under parallel-trend assumptions. These are scenario projections and do not replace subgroup-specific modelling from women-focused forecasting work [1,2,4].

Table 4a: Race/ethnicity stratified projected prevalence (women).

Group	Hypertension 2020 (%)	Hypertension 2050 (%)	Diabetes 2020 (%)	Diabetes 2050 (%)	Obesity 2020 (%)	Obesity 2050 (%)
Non-Hispanic White	39.9	50.4	10.6	18.7	39.6	56.9
Non-Hispanic Black	57.6	67.5	18.7	30.8	57.9	73.5
Non-Hispanic Asian	38.7	49.1	15.8	26.6	14.5	25.5
Hispanic	34.8	44.9	19.2	31.5	45.7	62.9

Baseline values are from NHANES 2017 to March 2020 tables for women. Projection shifts are anchored to overall women’s 2020 to 2050 projections [1,4]. The women-focused forecasting statement and related communications also report that projected increases for some risk factors may be particularly large among women of colour, and that baseline prevalence remains highest for multiple factors among Black women in particular [2].

Baseline values are from NHANES 2017 to March 2020 tables for women. Projection shifts are anchored to overall women’s 2020 to 2050 projections [1,4]. These patterns are consistent with longstanding evidence that cardiometabolic risk is socially patterned, and that without targeted prevention and access improvements, absolute inequities can persist or widen as overall prevalence rises [1,4].

Joint effect of hypertension, diabetes and obesity

The triad’s joint burden matters because clustering increases both individual risk and system-level complexity. Using NHANES women’s BMI-stratified prevalence as a transparent approximation, the prevalence of women with both obesity and hypertension is estimated at about 22.6%, and the prevalence of women with obesity and diabetes at about 9.6%, with an approximate triple overlap (obesity plus hypertension plus diabetes) of about 5.2% under a conditional-independence approximation. These are conservative scaffolding estimates intended to show the magnitude of joint exposure and to motivate more rigorous joint-distribution modelling in a full microsimulation or multistate model [4].

Sensitivity and scenario analyses

Women-focused forecasting communications emphasise that prevention and control improvements could meaningfully alter trajectories. Scenario analyses in this manuscript illustrate the scale of change if 2050 prevalence were reduced by 10% relative to status quo. Under this simplified scenario, hypertension would fall from 59.1% to 53.2%, diabetes from 25.3% to 22.8%, and obesity from 61.2% to 55.1%. The inverse scenario, a 10% relative worsening in 2050 prevalence, yields materially worse population risk profiles [1].

Source: status quo anchors from the women-specific forecasting statement. Scenario percentages are deterministic transformations for sensitivity illustration [1].

Source: NHANES 2017 to March 2020 tables for women. Estimates are approximations designed to highlight joint exposure burden and should be replaced with survey-weighted joint-distribution estimates in full modelling [4].

Victor Lambongang, Edwin Amachree, Chelsea Raviro Mazonde, Aminat Adebukola Amunigun (2026) Projected Rise of Cardiovascular Disease in US Women by 2050: A Life-Course Analysis of Hypertension, Diabetes and Obesity Trends. Int J Diabetes Case Rep, 2(1):01-08.

Discussion

Principal findings: This paper synthesises women-specific forecasts indicating substantial increases in hypertension, diabetes and obesity prevalence among US women by 2050, alongside increases in multiple CVD endpoints including total CVD and stroke. The magnitude and direction of these projections suggest that cardiometabolic prevention in women will remain central to CVD burden management in coming decades [1,2].

Interpretation of the life-course pattern: The life-course framing adds interpretive value by linking two simultaneous dynamics. First, baseline NHANES data show that prevalence of hypertension and diabetes in women rises sharply with age, which means that an expanding older-adult female population will disproportionately contribute to absolute burden. Second, projections indicate upward shifts in overall prevalence for the triad, which implies that each life stage is likely to move to a higher-risk baseline over time unless prevention substantially improves [1,4-6]. In practical terms, this means the midlife and older-adult stages are projected to carry the largest absolute disease counts, while younger-adult stages remain critically important for primary prevention that can alter cumulative exposure [1,4].

Comparison with prior projection literature: General-population projection modelling using NHANES regression plus Census projections has similarly forecast growth in multiple cardiovascular risk factors and clinical diseases, with disproportionate increases among racial and ethnic minority groups. This methodological convergence supports the plausibility of women-specific projections identifying worsening cardiometabolic exposures and persistent disparities [7]. Women-only forecasting extends this by quantifying women-specific trajectories for risk factors and CVD endpoints through 2050, explicitly complementing broader forecasts of CVD burden in the US population and clarifying why women-focused prevention, including earlier-life prevention, is urgent [1, 7].

Biological and social mechanisms: Several plausibility mechanisms support the projected life-course pattern. Cumulative vascular burden from sustained elevated blood pressure contributes to arterial remodelling and end-organ damage across decades. Adiposity and insulin resistance interact, increasing diabetes risk and worsening blood pressure control. Menopause transition is associated with changes in body composition and metabolic risk profiles, and pregnancy-related exposures can identify or contribute to later cardiometabolic risk. Social disadvantage and structural inequities shape food environments, stress exposure, care access and chronic disease management, contributing to persistent disparities documented in baseline NHANES tables and highlighted in women-focused forecasting outputs [1,2,4].

Clinical implications: Projected increases in the triad strengthen the clinical case for earlier detection and durable control across women's life stages. This includes: proactive blood pressure screening in young and midlife women, aggressive risk factor management in women with obesity,

structured diabetes prevention and early glycaemic control, and more consistent longitudinal follow-up for women at elevated cardiometabolic risk. Because the triad clusters strongly in national data, integrated cardiometabolic care pathways may be more effective than isolated single-disease programmes, particularly for women facing socioeconomic barriers [4].

Public health and policy implications: From a policy perspective, these projections highlight the need for sustained population prevention strategies and targeted equity interventions. The most scalable levers include improving access to preventive care, reducing financial barriers to chronic disease management, strengthening community-based prevention infrastructures, and addressing upstream determinants that drive obesity and diabetes risk. Women-focused forecasting communications emphasise that the trajectory is not immutable and that targeted prevention could change population outcomes, which supports investment in prevention across the life course rather than concentrating resources only in older-age treatment settings [1,2].

Strengths: This manuscript integrates (i) women-specific 2050 forecasting anchors, (ii) nationally representative baseline prevalence tables for women, and (iii) official population denominators that allow translation from prevalence to counts. It explicitly operationalises a life-course frame using age strata compatible with national surveillance tables and provides reproducible tables and downloadable figures to support transparency and future extension into more complex modelling [1,4-6].

Limitations: Several limitations should be considered. First, intermediate-year estimates for 2030 and 2040 are interpolated between 2020 and 2050 anchors rather than directly estimated from the underlying forecasting model, so they represent a modelling scaffold. Second, age-group specific projections apply a shared-trend logit shift to baseline age strata. This assumes parallel trend behaviour across age groups, which may not hold if younger cohorts experience disproportionate risk factor growth or if older-age control improves. Third, the joint-effect (triad overlap) estimates are approximations designed to be transparent. They should be replaced by survey-weighted joint-distribution estimates or microsimulation outputs in a full modelling version. Fourth, the analysis focuses on the triad and uses subgroup stratification available in NHANES tables. Additional reproductive-history variables and more granular life-course staging would strengthen causal interpretation and policy relevance in a full Scopus-journal submission [1,4].

Conclusion

Women-focused projections indicate that, by 2050, US women will likely face markedly higher prevalence of hypertension, diabetes and obesity, alongside increasing prevalence of multiple CVD endpoints including total CVD and stroke. Baseline nationally representative data already show strong age gradients and socioeconomic inequalities, which suggests that

Table 4b: Socioeconomic stratified projected prevalence using family income relative to federal poverty level (women).

Group	Hypertension 2020 (%)	Hypertension 2050 (%)	Diabetes 2020 (%)	Diabetes 2050 (%)	Obesity 2020 (%)	Obesity 2050 (%)
≤130% FPL	46.3	56.9	18.7	30.8	47.9	65.0
130-350% FPL	41.6	52.1	17.1	28.5	48.8	65.8
>350% FPL	38.3	48.7	8.1	14.6	35.1	52.2

Table 5: Sensitivity and scenario analyses

Table 5a: Scenario analysis under improved prevention versus status quo (women, 2050)

Metric	2050 status quo (%)	2050 improved prevention (10% relative reduction) (%)	2050 worsening (10% relative increase) (%)
Hypertension	59.10	53.19	65.01
Diabetes	25.30	22.77	27.83
Obesity	61.20	55.08	67.32

Source: status quo anchors from the women-specific forecasting statement. Scenario percentages are deterministic transformations for sensitivity illustration [1].

Table 5b: Approximate joint-effect prevalence scaffold (women, baseline).

Measure	Estimated prevalence (%)
Obesity plus hypertension (approx.)	22.6
Obesity plus diabetes (approx.)	9.6
Obesity plus hypertension plus diabetes (approx.)	5.2

Source: NHANES 2017 to March 2020 tables for women. Estimates are approximations designed to highlight joint exposure burden and should be replaced with survey-weighted joint-distribution estimates in full modelling [4].

population ageing plus widening absolute exposure differences could compound future burden if trajectories remain unchanged. A life-course prevention approach that begins earlier, integrates cardiometabolic risk management, and targets equity is consistent with the scale and pattern of projected burden.

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