

Visualization tools

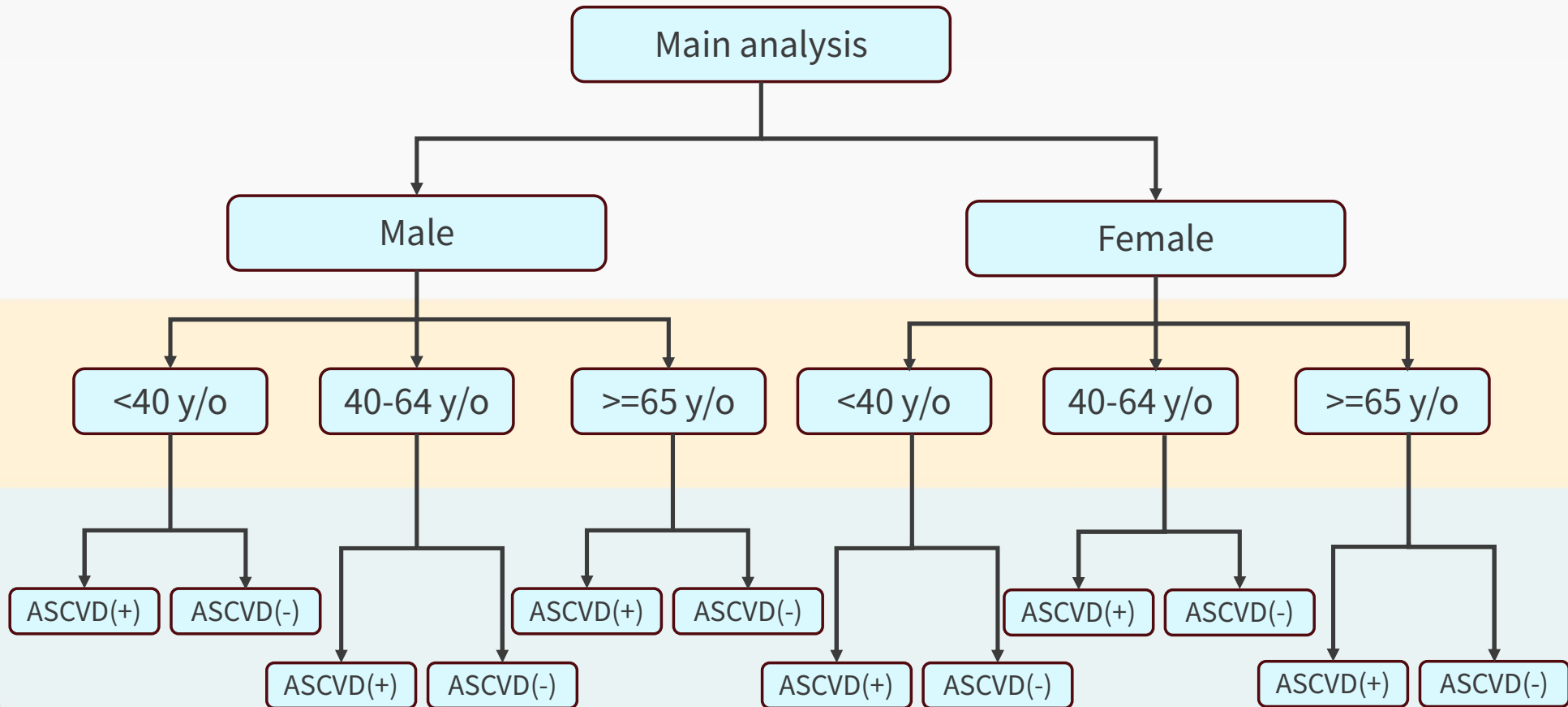
Avery Yang

Population Health Data Center NCKU
National Cheng Kung University



成大群體健康數據中心
Population Health Data Center NCKU

How traditional study report results



What we do



Appendices containing hundreds of pages

- Results from various analyses
- Results from several countries
- Complicated table/ figures

Research visualization dashboards

- User-friendly
- Enhance transparency
- Inform decision-making

RWE visualization dashboards

Background

Real-world evidence (RWE) has emerged as an important source of insights for healthcare decision-making.

Key challenges of interpreting RWE :

1. Data complexity
2. Design complexity
3. Stakeholder diversity

Solution

RWE visualization refer to using visual tools to effectively communicate insights from RWE researches.

The dashboard was designed to be:

1. Clearly interpreted
2. Interactive
3. Comprehensive

Impact

RWE visualization bridges the gap between data science and decision-making by making research output **understandable** and **adaptable**.

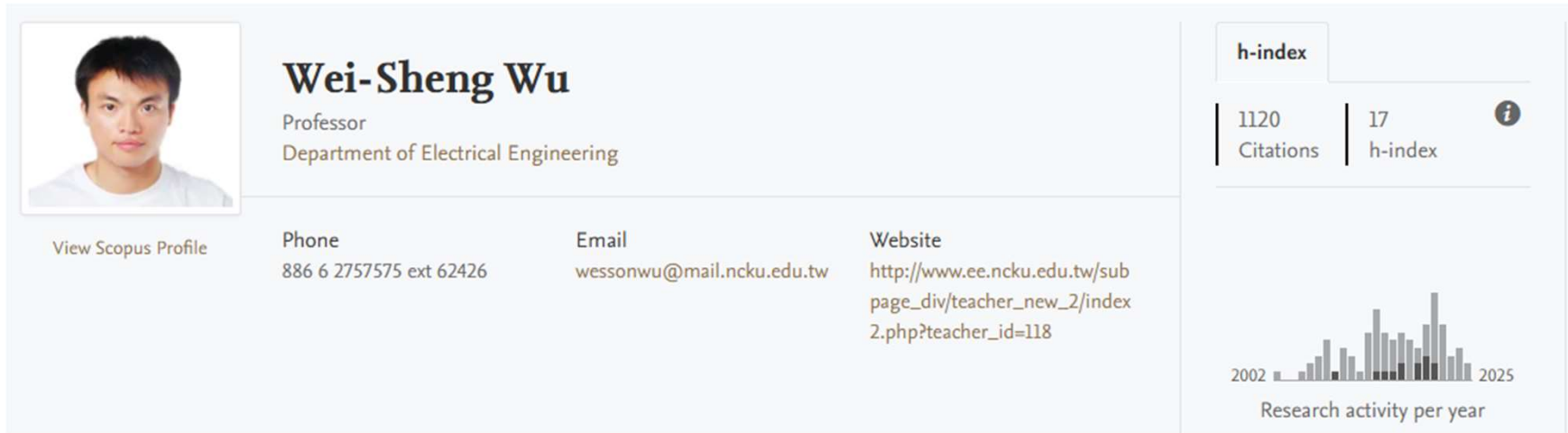
The visualization tool helps :

1. Regulatory review and policy adjustment
2. Shared decision-making
3. Hypothesis generation

Scan the QR code to visit website



Collaboration with Prof. Wu



Wei-Sheng Wu
Professor
Department of Electrical Engineering

[View Scopus Profile](#)

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h-index
1120 Citations | 17 h-index

Research activity per year (2002-2025)

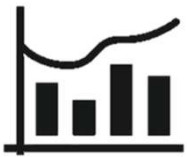
Affiliation:

- Department of Electrical Engineering, NCKU
- Finance and biological big data analysis Lab, NCKU

Specialities:

- Fintech
- Biological big data analysis
- Software development
- Database and web tool development

Key feature of the visualization dashboards



Epidemiology: to provide the prevalence and incidence rate during the study period



Characteristic: to present the baseline characteristics of the study cohort and identify any potential imbalances.



Drug utilization: to illustrate the use and transition patterns of the medication of interest.



Event rates/ risk estimates: to report the incidence rate, risk ratio of prespecified outcomes

Cohort selection

Study Description:

This study aims to examine the real-world treatment patterns and risk factor profiles, and the impact of lowering therapy utilization and subsequent cardiovascular events, in both Asian and Western cohorts, with implications for improving region-specific cardiovascular health.

Inclusion Criteria (n=571,249)
1. Hospitalization due to ASCVD from 2016 to 2022 (n=571,249)

Cohort Identification

Study Period

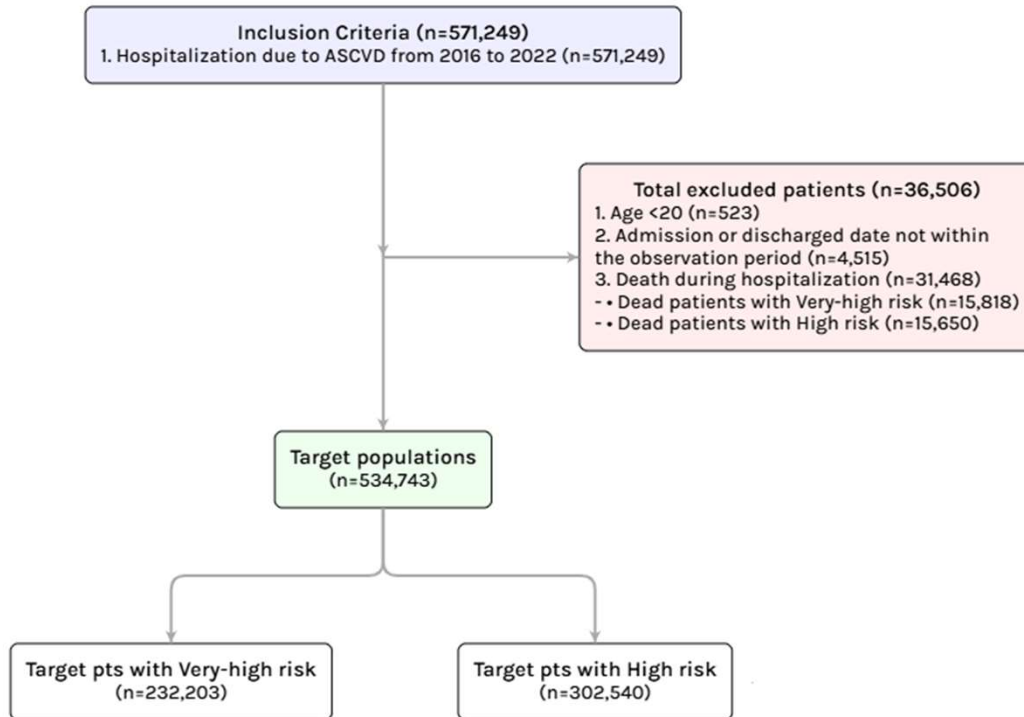
2016 - 2022 (Main Analysis)

2016 - 2019

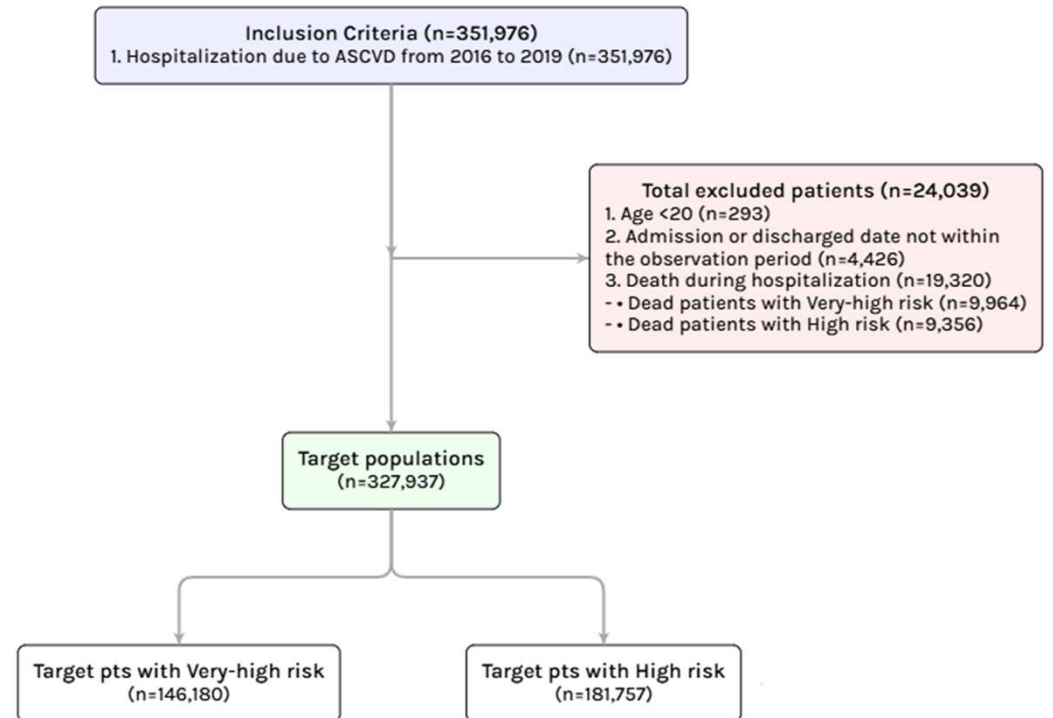
Comparison between cohorts



Main analysis (2016-2022)



Sensitivity analysis (2016-2019)



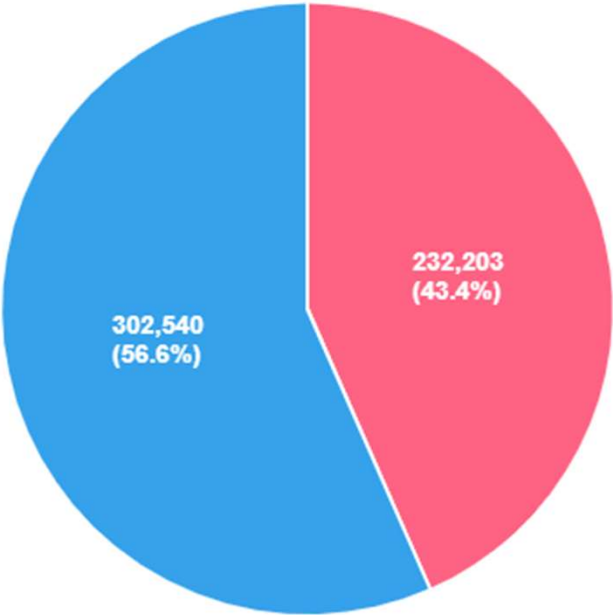
Explore the cohort by prespecified variables

Select Main Variable

Very high-risk or high risk group Sex Age Groups History of ASCVD

Apply

Very high-risk group High-risk group

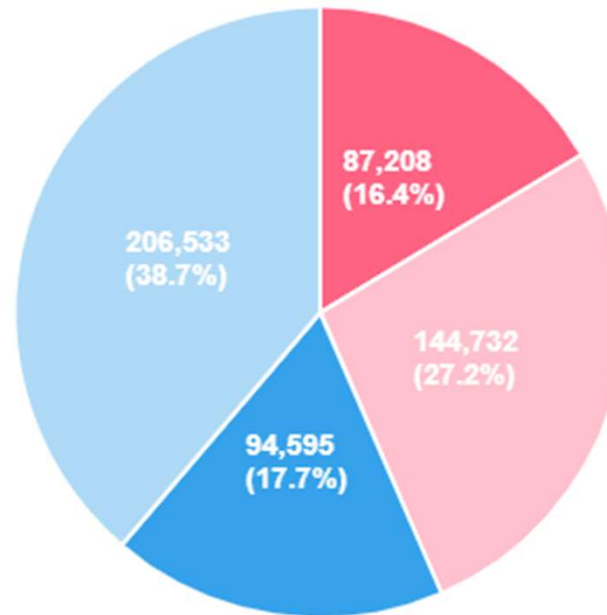
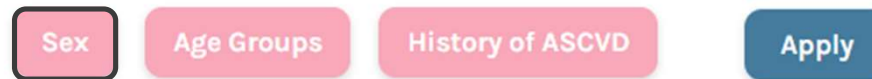


Explore the cohort by prespecified variables

Select Main Variable

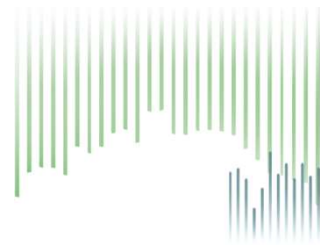


Then filter by subgroup (optional)

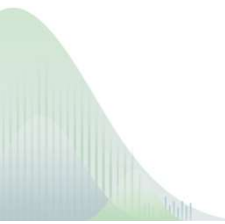
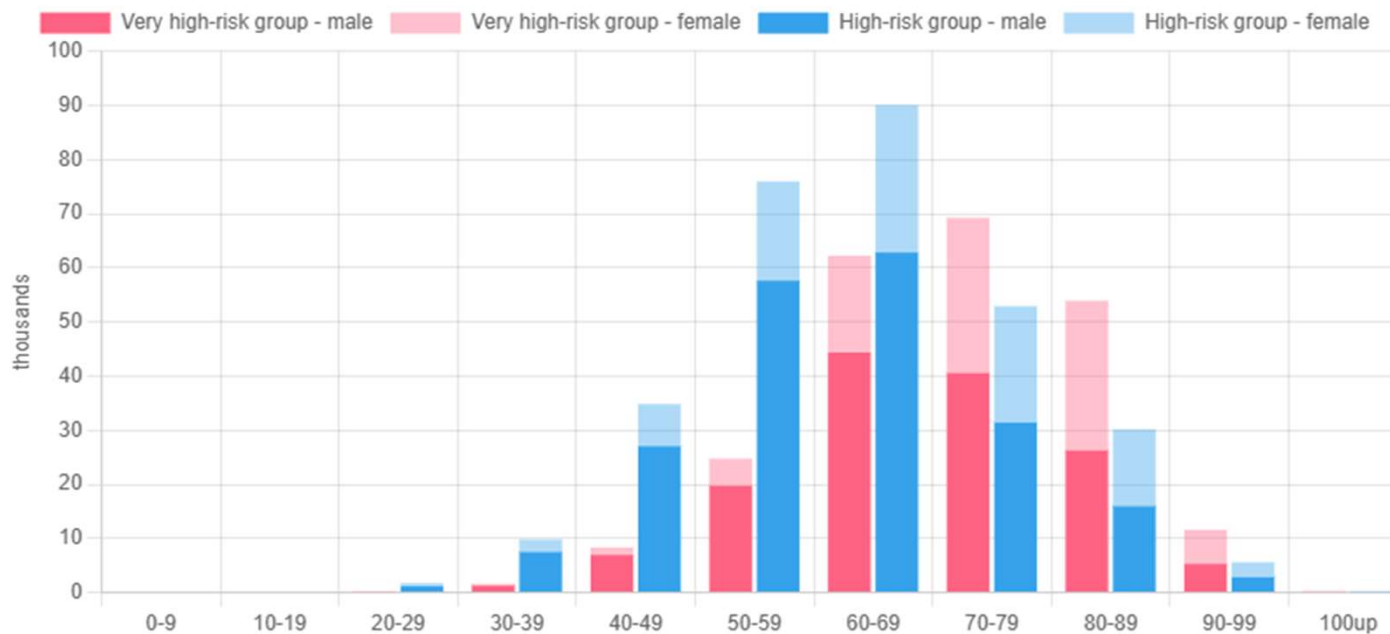


Very high-risk group High-risk group
High-risk group - male High-risk group - female
High-risk group - male

Distribution of cohort by age groups (need to update photo)

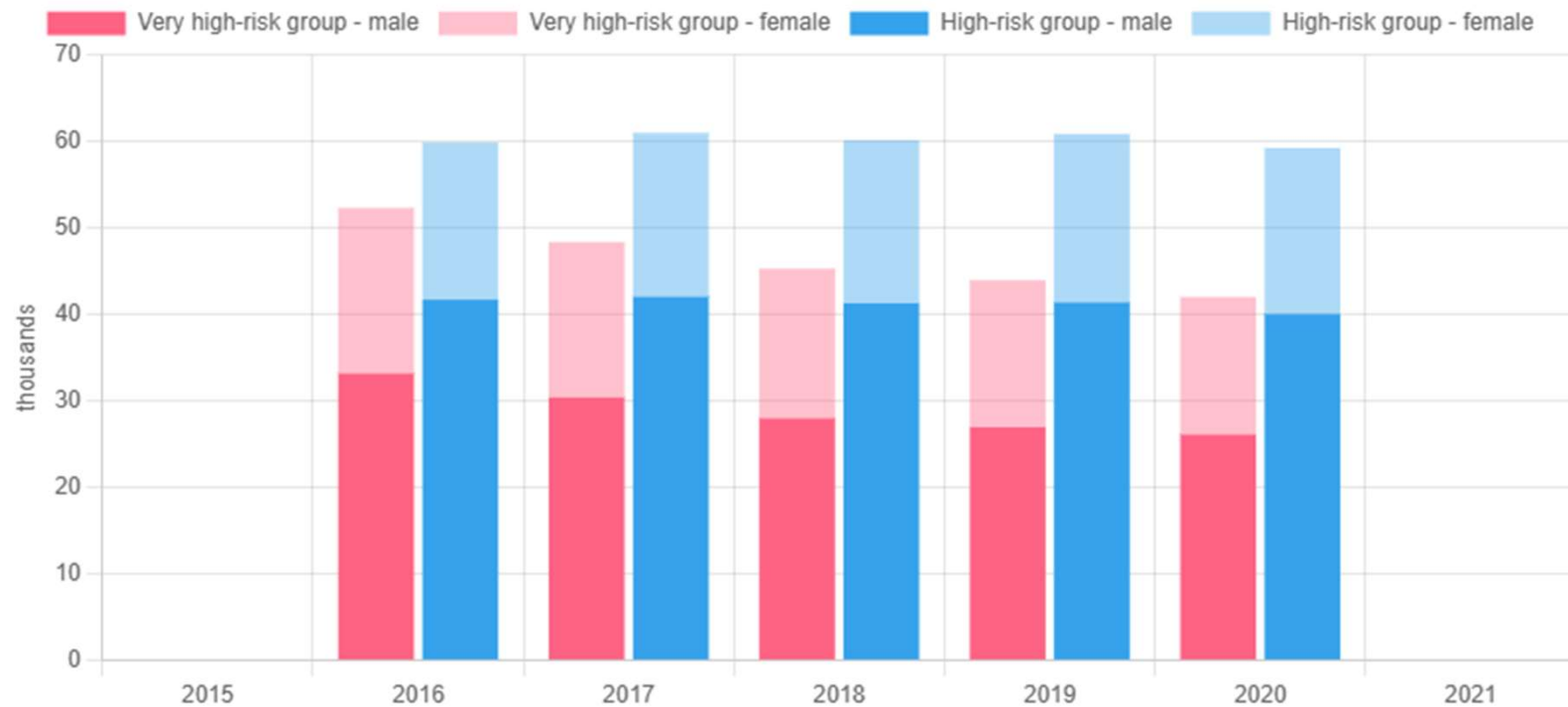


Distribution of Very high-risk or high risk group & Sex by Decade of Age



Distribution of cohort by calendar years (need to update photo)

Distribution of Very high-risk or high risk group & Sex by Calendar Year





Real-world lipid-lowering treatment patterns and cardiovascular outcomes among patients with ASCVD in Asia: A multi-country CDM-based study

Steven Shen, Brian Li, Tzichi Liao, Edward Lai

updated date: 1 June 2025



- Cohort Identification**
- Study period:
- 2016 - 2022 (main analysis)
 - 2016 - 2019

- Subgroup analysis**
- Age groups
- All (default)
 - 0 - 39
 - 40 - 64
 - 65+
- Sex
- All (default)
 - Male
 - Female
- History of ASCVD
- All (default)
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 - Without ASCVD history

Study Cohort	Epidemiology	Characteristics	Drug Utilization	Event Rates	Risk Estimate
Search tool					
Sort By: High to Low					
<input checked="" type="checkbox"/>	Total numbers			231940	301128
<input checked="" type="checkbox"/>	Age, years, mean (SD)			71.794 (11.883)	62.791 (13.220)
<input checked="" type="checkbox"/>	Age, years, median (Q1-Q3)			72.000 (65.000 - 81.000)	62.000 (54.000 - 72.000)
<input checked="" type="checkbox"/>	Sex				0.148
<input checked="" type="checkbox"/>	Female	181803 (34.105)		87206 (37.599)	94595 (31.414)
<input checked="" type="checkbox"/>	Sex ASCVD events				
<input checked="" type="checkbox"/>	ACS	126053 (23.647)		82198 (35.439)	43855 (14.564)
<input checked="" type="checkbox"/>	MI	78412 (14.710)		47877 (20.642)	30535 (10.140)
<input checked="" type="checkbox"/>	Stable or unstable angina	102145 (19.162)		36636 (15.795)	65509 (21.755)
<input checked="" type="checkbox"/>	Ischemic stroke	45164 (8.472)		3436 (1.481)	41728 (13.857)
<input checked="" type="checkbox"/>	Thrombotic stroke	164569 (30.872)		110458 (47.624)	54111 (17.969)
<input checked="" type="checkbox"/>	HA	40811 (7.656)		5373 (2.317)	35438 (11.768)
<input checked="" type="checkbox"/>	AF	8879 (1.666)		7840 (3.380)	1039 (0.345)
<input checked="" type="checkbox"/>	AD	189663 (35.580)		75263 (32.449)	114400 (37.990)
<input checked="" type="checkbox"/>	ADG	10899 (2.045)		4002 (1.725)	6897 (2.290)
<input checked="" type="checkbox"/>	Risk factors related to recurrent ASCVD				
<input checked="" type="checkbox"/>	More than 2 major ASCVDs	25383 (4.762)		25383 (10.944)	0 (0.000)
<input checked="" type="checkbox"/>	Major ASCVDs + 2 high-risk conditions	206537 (38.749)		206537 (89.056)	0 (0.000)
<input checked="" type="checkbox"/>	History of ASCVD	200318 (37.578)		108057 (46.589)	92261 (30.638)
<input checked="" type="checkbox"/>	Major ASCVD events				
<input checked="" type="checkbox"/>	Recent ACS event	140450 (26.347)		93933 (40.499)	46517 (15.448)
<input checked="" type="checkbox"/>	History of MI	19646 (3.685)		17396 (7.500)	2250 (0.747)
<input checked="" type="checkbox"/>	Ischemic stroke	188029 (35.273)		130557 (56.289)	57472 (19.086)
<input checked="" type="checkbox"/>	Asymptomatic PAD	18266 (3.427)		16755 (7.224)	1511 (0.502)
<input checked="" type="checkbox"/>	High-risk conditions				
<input checked="" type="checkbox"/>	Age > 65 y	303277 (56.893)		175531 (75.679)	127746 (42.422)
<input checked="" type="checkbox"/>	Heterozygous familial hypercholesterolemia (≥7801)	0 (0.000)		0 (0.000)	0 (0.000)
<input checked="" type="checkbox"/>	History of prior CABG/PCI outside of the major ASCVD event(s)	84620 (15.874)		0 (0.000)	84620 (28.101)
<input checked="" type="checkbox"/>	Diabetes mellitus	202892 (38.061)		128016 (55.194)	74876 (24.865)
<input checked="" type="checkbox"/>	Hypertension	360147 (67.561)		206327 (88.957)	153820 (51.081)
<input checked="" type="checkbox"/>	History of congestive HF	84060 (15.769)		53942 (23.257)	30118 (10.002)
<input checked="" type="checkbox"/>	Current smoking	25389 (4.763)		14280 (6.157)	11109 (3.689)
<input checked="" type="checkbox"/>	LDL	102522 (19.232)		68134 (29.376)	34388 (11.420)
<input checked="" type="checkbox"/>	LDL1	0 (0.000)		0 (0.000)	0 (0.000)
<input checked="" type="checkbox"/>	LDL2	102522 (19.232)		68134 (29.376)	34388 (11.420)
<input checked="" type="checkbox"/>	AFR, missing	526501 (98.768)		231940 (100.000)	294561 (97.819)
<input checked="" type="checkbox"/>	Persistently elevated LDL-C despite maximally tolerated statin therapy and ezetimibe	30839 (5.785)		18334 (7.905)	12505 (4.153)
<input checked="" type="checkbox"/>	LDL1	0 (0.000)		0 (0.000)	0 (0.000)
<input checked="" type="checkbox"/>	LDL2	30839 (5.785)		18334 (7.905)	12505 (4.153)
<input checked="" type="checkbox"/>	Other comorbidities				
<input checked="" type="checkbox"/>	Charlson Comorbidity Index, mean (SD)	3.605 (2.539)		4.650 (2.577)	2.801 (2.193)
<input checked="" type="checkbox"/>	Charlson Comorbidity Index, median (Q1-Q3)	3.000 (2.000 - 5.000)		4.000 (3.000 - 6.000)	2.000 (1.000 - 4.000)
<input checked="" type="checkbox"/>	Hyperlipidaemia	323098 (60.611)		147876 (63.759)	175222 (58.189)
<input checked="" type="checkbox"/>	Severe hypercholesterolemia (≥2720, ≥780)	55228 (10.360)		26442 (11.400)	28786 (9.559)
<input checked="" type="checkbox"/>	CPD	82751 (15.524)		42770 (18.440)	39981 (13.277)
<input checked="" type="checkbox"/>	Chronic kidney disease	118989 (22.322)		76806 (33.115)	42183 (14.008)
<input checked="" type="checkbox"/>	Rheumatoid arthritis	9112 (1.709)		4233 (1.825)	4879 (1.620)
Apply					

Design diagram for characteristic page

Interested characteristics selection:

1. Search tool
2. Apply the filter

Click the box then apply for visualization plot generation

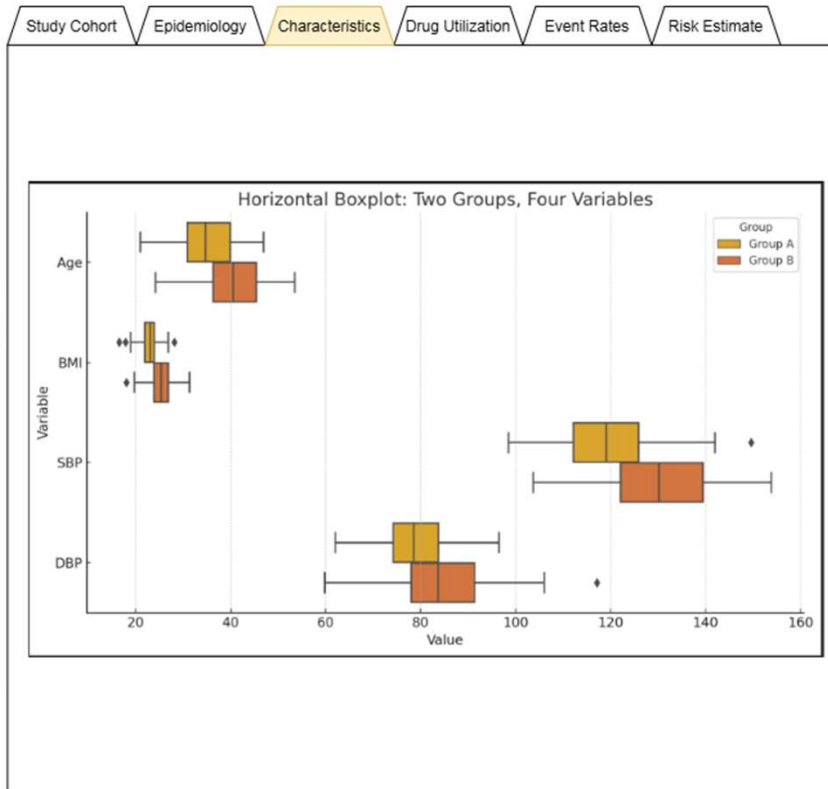
Visualization plot of continuous characteristics



Real-world lipid-lowering treatment patterns and cardiovascular outcomes among patients with ASCVD in Asia: A multi-country CDM-based study

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Cohort Identification

Study period:

- 2016 - 2022 (main analysis)
- 2016 - 2019

Subgroup analysis

Age groups

- All (default)
- 0 - 39
- 40 - 64
- 65+

Sex

- All (default)
- Male
- Female

History of ASCVD

- All (default)
- With ASCVD history
- Without ASCVD history

Visualization plot of categorical characteristics



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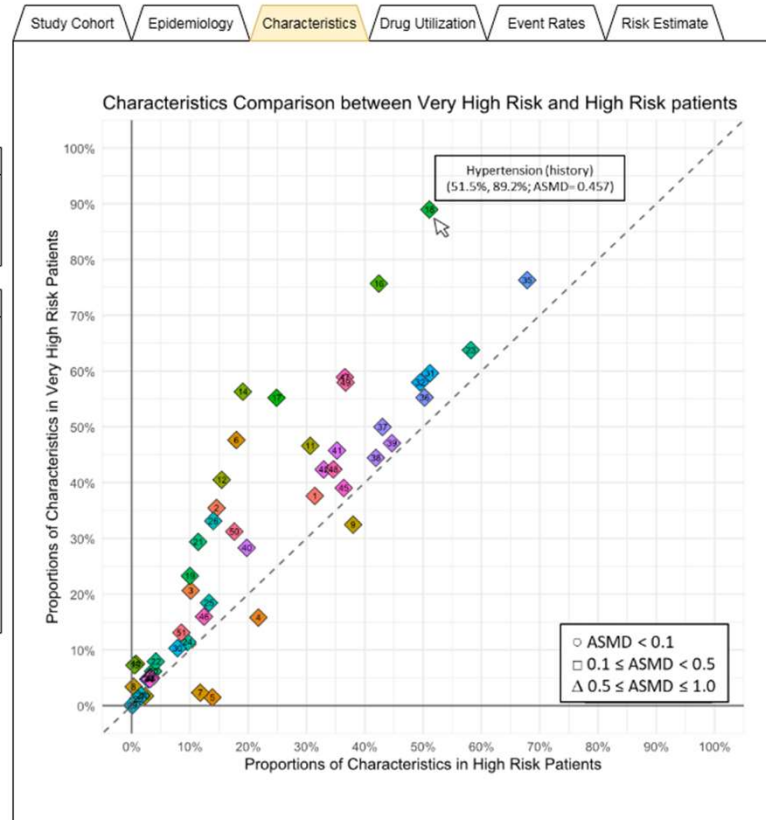
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Cohort Identification	
Study period:	<ul style="list-style-type: none"> • 2016 - 2022 (main analysis) • 2016 - 2019

Subgroup analysis	
Age groups	<ul style="list-style-type: none"> • All (default) • 0 - 39 • 40 - 64 • 65+
Sex	<ul style="list-style-type: none"> • All (default) • Male • Female
History of ASCVD	<ul style="list-style-type: none"> • All (default) • With ASCVD history • Without ASCVD history



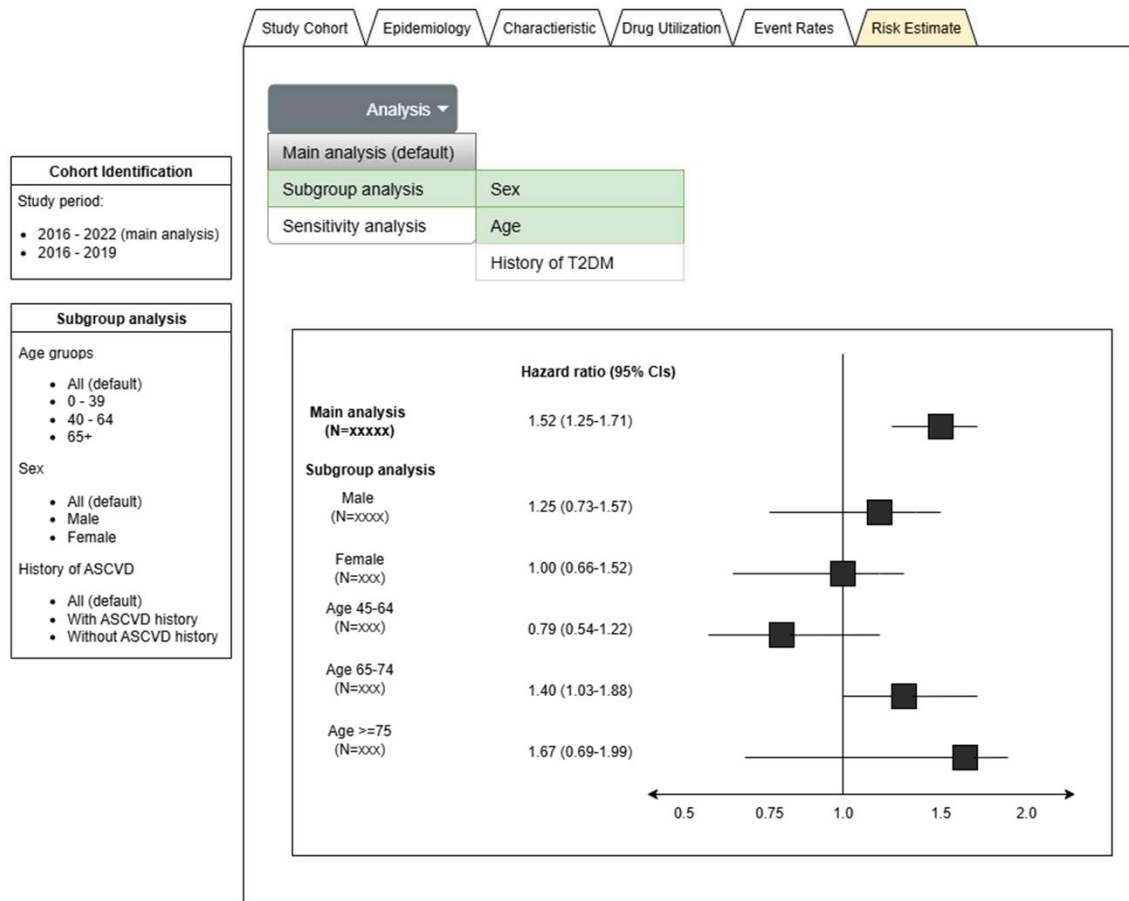
Visualization plot of risk estimate



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Thank You

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