PORTHOS
ESTUDO DE PREVALÊNCIA DE INSUFICIÊNCIA CARDÍACA EM PORTUGAL

PORTHOS

The Portuguese Heart Failure Prevalence Observational Study

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Sociedade Portuguesa de CARDIOLOGIA

AstraZeneca

NOVA MEDICAL SCHOOL

On behalf of the PORTHOS Investigators

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Clinical Trials.gov Registration number NCT05434923

HF Prevalence

Do we know the real numbers?

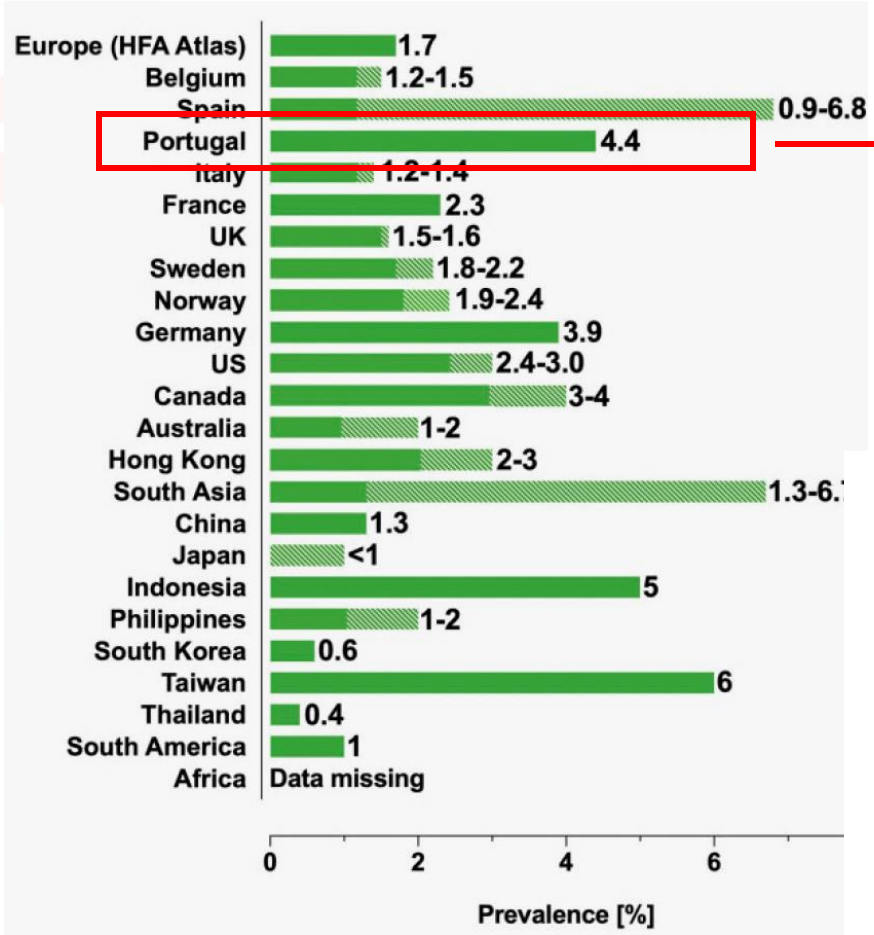
Prevalence

Prevalence 1-3% in general adult population

Overall prevalence ↑

Prevalence in HFrEF ↔

Prevalence In HFpEF ↑



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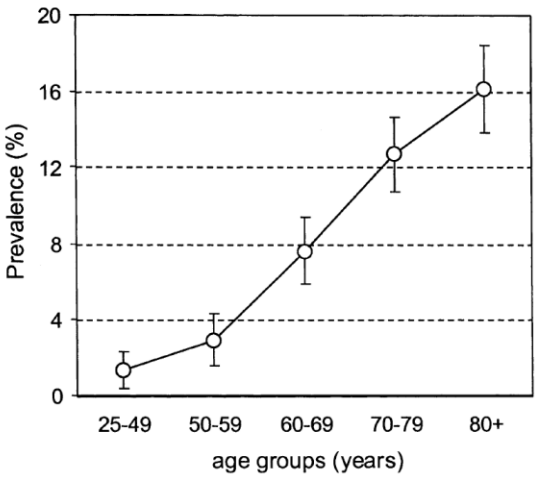
ELSEVIER
The European Journal of Heart Failure 4 (2002) 531–539
The European Journal of Heart Failure
www.elsevier.com/locate/heafai

Prevalence of chronic heart failure in Southwestern Europe: the EPICA study

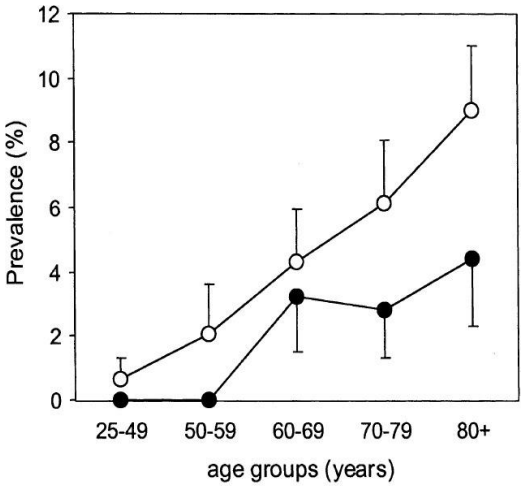
Fátima Ceia[a,1,*], Cândida Fonseca[a,1], Teresa Mota[b,2], Humberto Morais[c,3], Fernando Matias[c,3], António de Sousa[c,3], António Gouveia Oliveira[d,4], on behalf of the EPICA Investigators[5]

[a]Department of Internal Medicine, Medical Sciences School, New University of Lisbon, Lisbon, Portugal
[b]Department of Cardiology, Medical Sciences School, New University of Lisbon, Lisbon, Portugal
[c]EPICA Working Group, Lisbon, Portugal
[d]Datamédica, Lisbon, Portugal

5434 screened individuals
44 per 100 000



PRESERVED LV SYSTOLIC FUNCTION
(SF> 28%, without severe LV dyskinesia, and LA dilatation or incresased LVM)



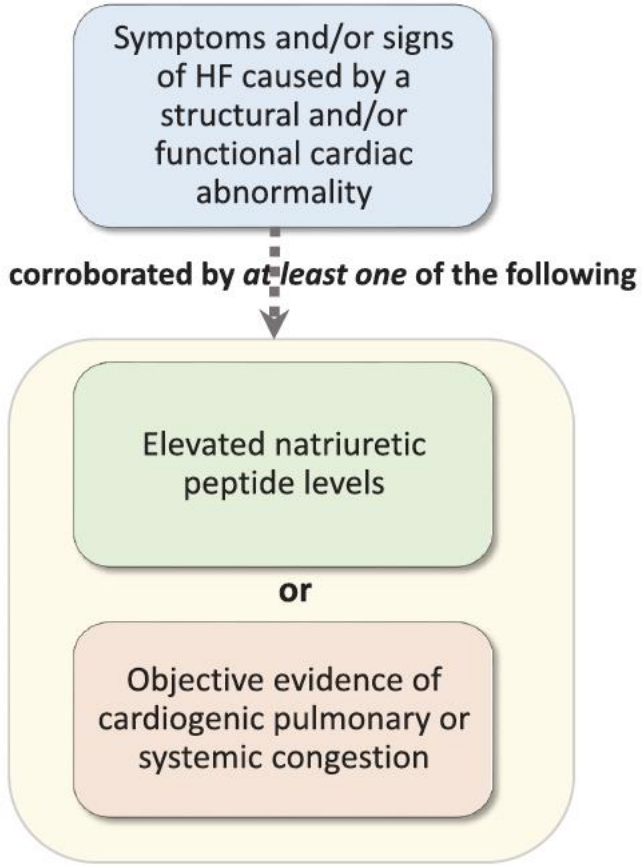
Savarese G, et al. Cardiovasc Res. 2023 Jan 18;118(17):3272-3287.

F Ceia et al. Eur J Heart Failure 2002:531-539

HF Prevalence

How to define a HF case?

Universal Definition of Heart Failure



Bozcurt et al. European Journal of Heart Failure (2021) 23, 352–380

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The conceptual basis for a Universal Definition of Heart Failure: congestion due to cardiac dysfunction

John G.F. Cleland[1,2,3,*], Pierpaolo Pellicori[1], James L. Januzzi[4], Faiez Zannad[5], Andrew L. Clark[6], Mark Richards[7,8], John J.V. McMurray[3], and Christian Mueller[9]

"insisting on diagnostic certainty may also be detrimental if it ***delays intervention until the disease is severe****, or inappropriately excludes patients from treatment, or* ***underestimates the size of the problem****".*

Bauersachs et al. European Heart Journal (2021) 42, 2331–2343

HF Prevalence

How to diagnose HFpEF in the community?

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Heart failure with preserved ejection fraction: everything the clinician needs to know

Patricia Campbell, Frans H Rutten, Matthew MY Lee, Nathaniel M Hawkins, Mark C Petrie

*"There are **no modern prospective, population-based studies** using natriuretic peptides and detailed echocardiography **to assess the true prevalence of HFpEF".***

*"If such a study were to be conducted, especially **with a liberal interpretation of the ESC's definition of HFpEF**, it is possible that the prevalence of HFpEF would be **much higher** than currently cited".*

The Lancet. February 14, 2024 https://doi.org/10.1016/S0140-6736(23)02756-3

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Objectives

OBJECTIVES

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Primary Objective:

- **Estimate the prevalence of HF among Portuguese adults aged 50 years and older.**

Secondary Objectives:

- Determine the prevalence of **HF phenotypes** according to the LVEF
- Determine **age and sex-specific** HF prevalence rates

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Methods

METHODS

Population and sampling

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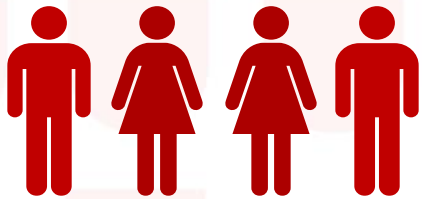
Portuguese citizens
Age ≥50 years

~ 4 260 272, Census 2011
~ 4 677 908, Census 2021



Inclusion criteria

- **Mainland Portugal**
- **Registered in the National Health Service (>99% of the population)**
- **Informed consent**

Exclusion criteria

- Living in an institution (e.g., nursing homes, prisons, military facilities)
- Being unable to speak and understand Portuguese
- Any disability limiting study participation

Participants will be selected through a **multistage sampling methodology**, using the National Health Service (SNS) registry as the sampling frame. Subjects aged 50 + registered in the Primary Care Centres Groups (ACES) will be **stratified by age and gender** and **selected randomly**.

Baptista R, Silva Cardoso J, Canhão H, et al. Portuguese Heart Failure Prevalence Observational Study (PORTHOS) rationale and design – A population-based study. *Rev Port Cardiol*. 2023;42(12):985-995.

METHODS

Case definition

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HFrEF

- **Self-reported** fatigue, shortness of breath, orthopnea or edema (≥NYHA II accessed by a structured questionnaire)
- **NT-proBNP ≥125 pg/mL**
- **LVEF ≤40%**

HFmrEF

- **Self-reported** fatigue, shortness of breath, orthopnea or edema (≥NYHA II accessed by a structured questionnaire)
- **NT-proBNP ≥125 pg/mL**
- **LVEF 41-49%**

HFpEF

- **Self-reported** fatigue, shortness of breath, orthopnea or edema (≥NYHA II accessed by a structured questionnaire)
- **NT-proBNP ≥125 pg/mL**
- **LVEF ≥50% and validating HFA-PEFF** diagnostic algorithm up to Step E with score **≥5 points***

*** HFA-PEFF score ≤ 1 points excludes HFpEF.**
2–4 points is considered indeterminate diagnosis and, therefore, not diagnostic of HFpEF

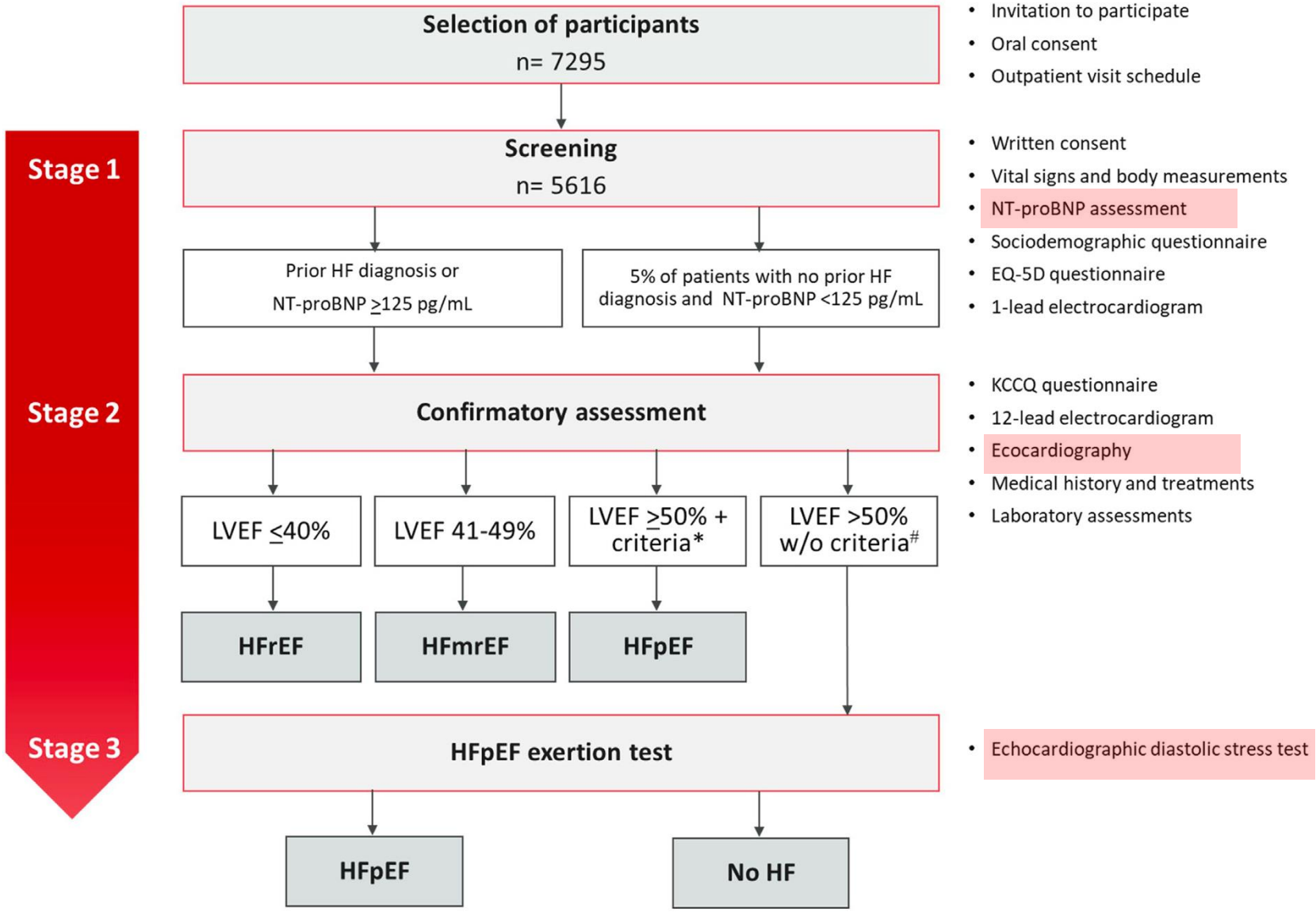
Baptista R, Silva Cardoso J, Canhão H, et al. Portuguese Heart Failure Prevalence Observational Study (PORTHOS) rationale and design – A population-based study. *Rev Port Cardiol*. 2023;42(12):985-995.

METHODS

Sample Size

Sample size

Sample size calculation was based on the **expected prevalence of HF of 2.5%,** with an absolute precision of 0.5% and design effect of 1.5 to account for clustering



Baptista R, Silva Cardoso J, Canhão H, et al. Portuguese Heart Failure Prevalence Observational Study (PORTHOS) rationale and design – A population-based study. *Rev Port Cardiol*. 2023;42(12):985-995.

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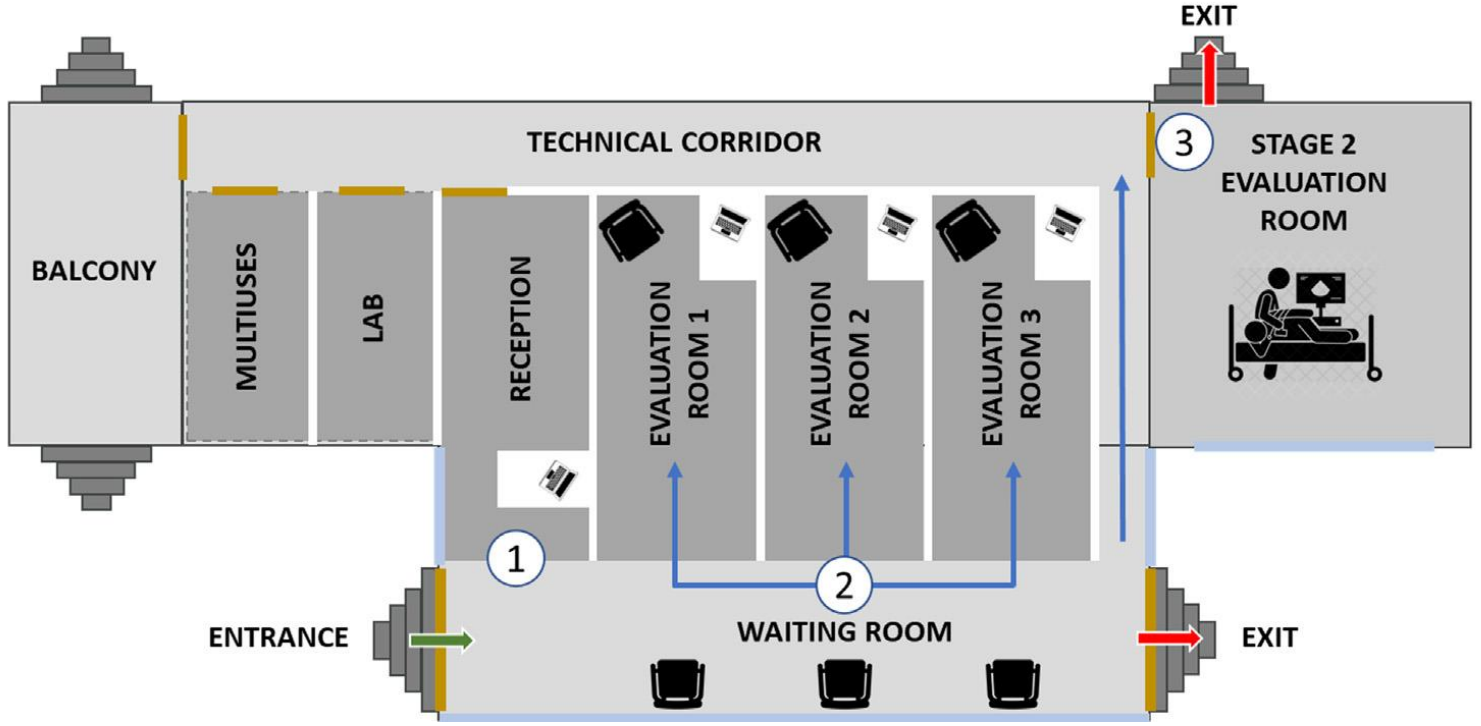
The PORTHOS Mobile Clinic

A

B



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Results

RESULTS

The PORTHOS cohort versus the Portuguese Census 2021

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	PORTHOS n = 6 189	Census 2021 age ≥ 50 years n = 4 677 908
Sex		
Men	2.774 (44.8%)	1.981.950 (42.4%)
Women	3.415 (55.2%)	2.695.958 (57.6%)
Age (years)		
50-59	2.098 (33.9%)	1.491.780 (31.9%)
60-69	1.812 (29.3%)	1.377.940 (29.5%)
70 +	2.279 (36.8%)	1.808.188 (36.7%)
NUTS II (region)		
Norte	2.375 (38.4%)	1.700.375 (36.3%)
Centro	1.062 (17.2%)	875.067 (18.7%)
Lisboa e Vale do Tejo	2.181 (35.2%)	1.611.899 (34.5%)
Alentejo	303 (4.9%)	270.340 (5.8%)
Algarve	268 (4.3%)	220.227 (4.7%)

RESULTS

Estimated Prevalence in individuals 50+ living in Mainland Portugal

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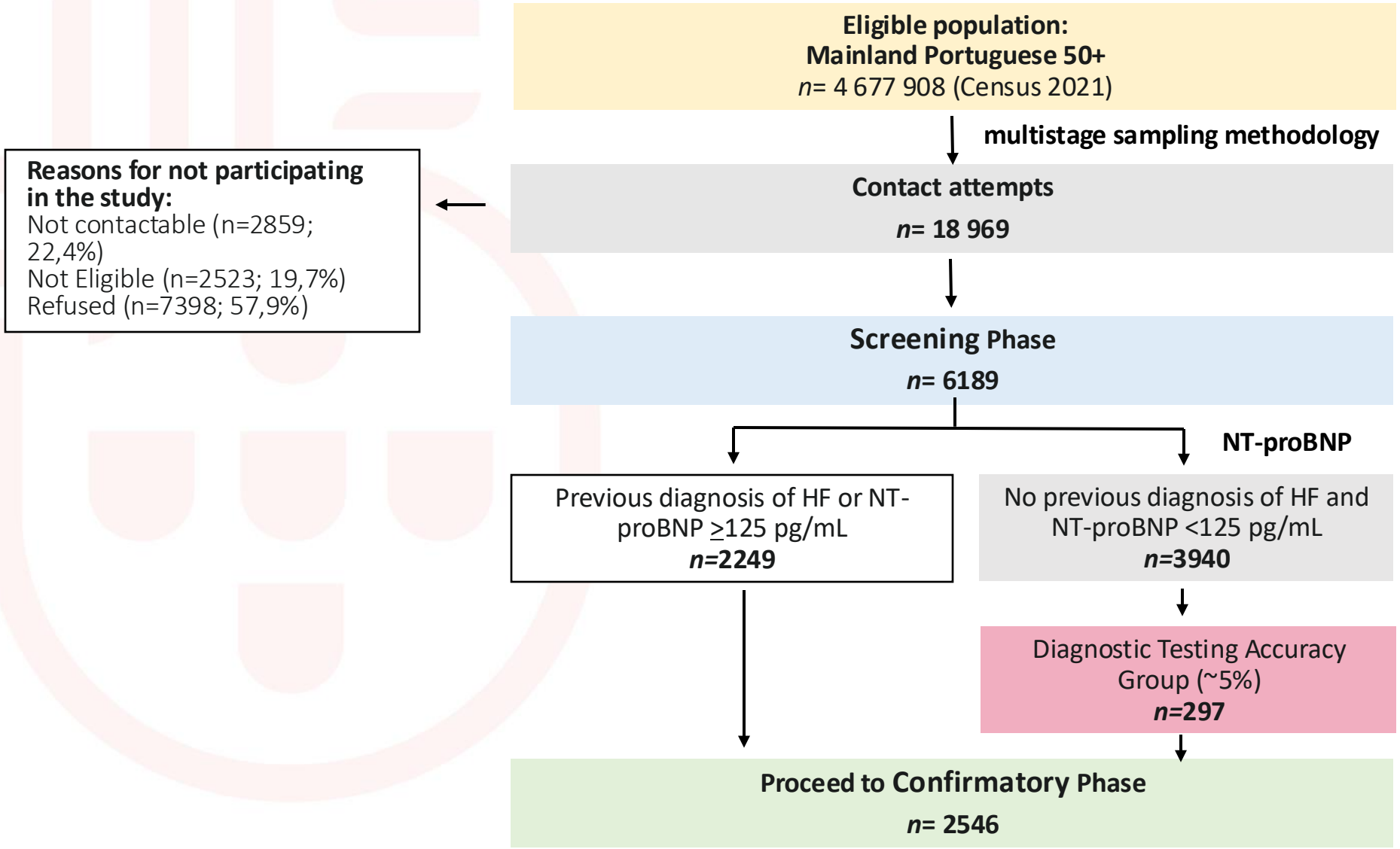

RESULTS

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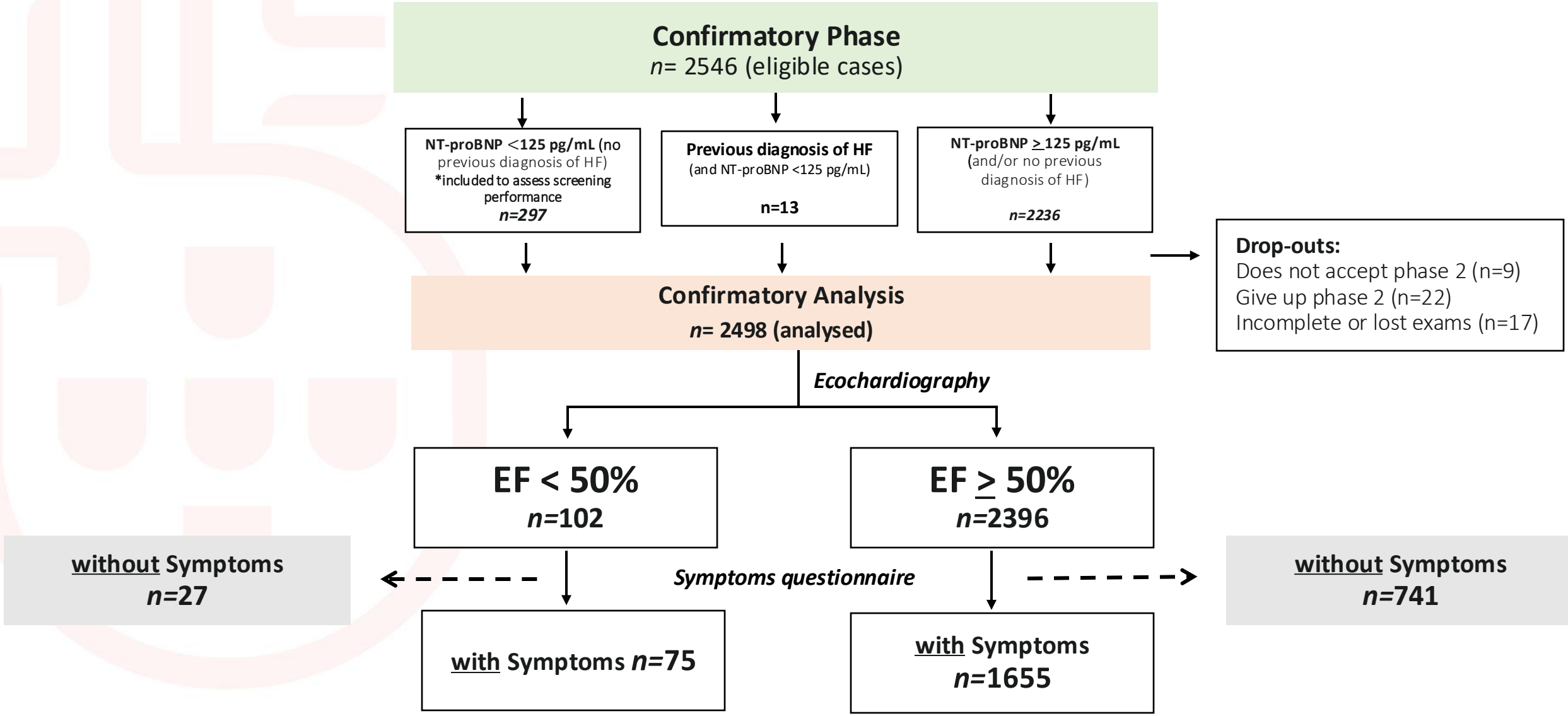

RESULTS

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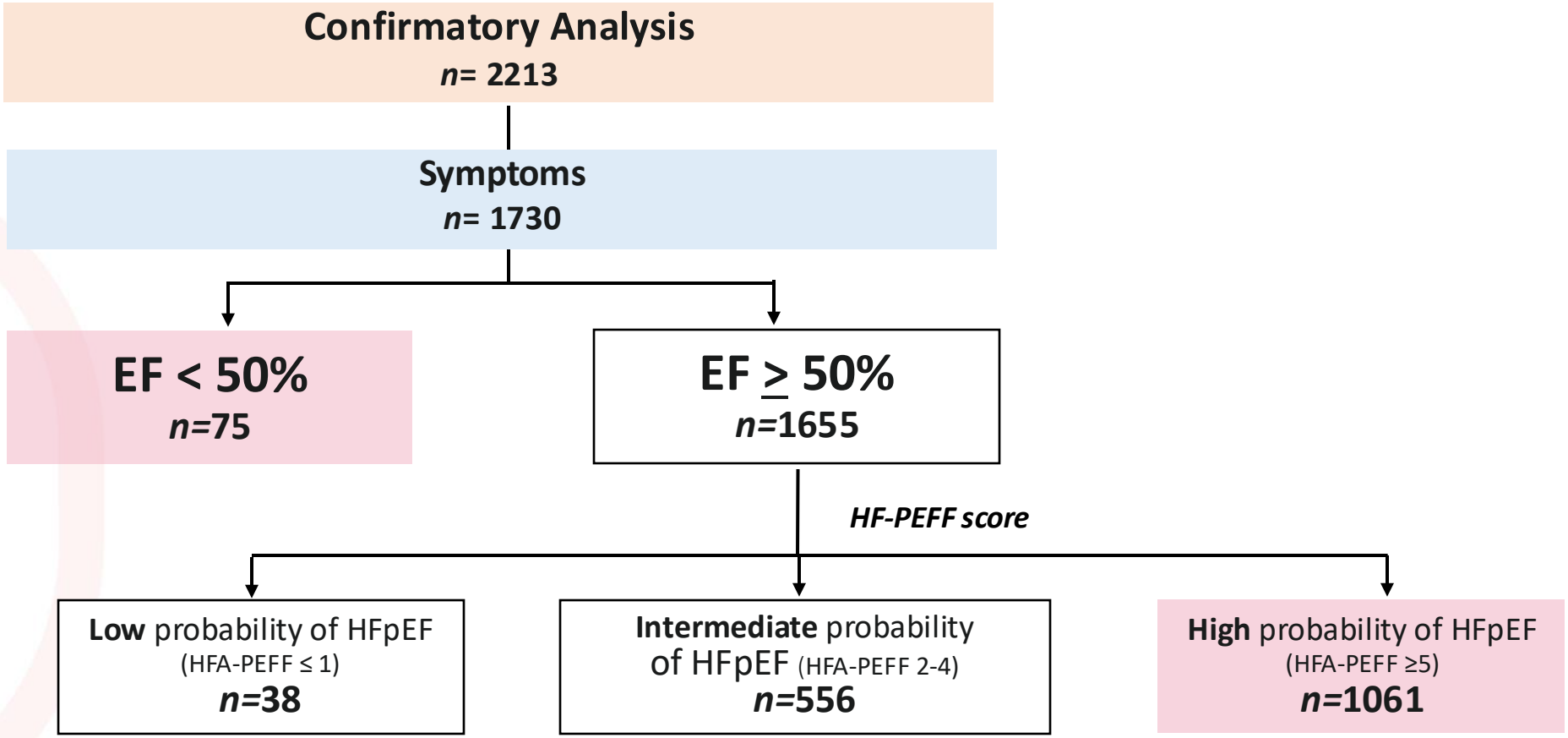

RESULTS

Estimated Prevalence in individuals 50+ living in Mainland Portugal

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Estimated HF Prevalence
***n*=1136**
16.54% (14.88 – 18.35%)

HFrEF	HFmrEF	HFpEF
***n*=23**	***n*=52**	***n*=1061**
0.35 % (0.23 – 0.55%)	**0.97 %** (0.49 – 1.91%)	

1.32 % (0.72 – 2.20%)

HFrEF + HFmrEF Prevalence

15.22 % (13.73 – 16.84%)

HFpEF Prevalence

RESULTS

Sensitivity analysis excluding: Primary Valvular Heart Disease*

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Estimated HF Prevalence
***n*=1037**
15.66% (14.03 – 17.44%)

HFrEF	HFmrEF	HFpEF
***n*=20**	***n*=46**	***n*=971**

1.27 % (0.73 – 2.19%)

HFrEF + HFmrEF Prevalence

14.39 % (12.94 – 15.98%)

HFpEF Prevalence

* **Valvular Heart Disease** (VHD): moderate to severe primary valvular disease: n=150 (3.45%)

RESULTS

Sensitivity analysis excluding: HFpEF mimics*

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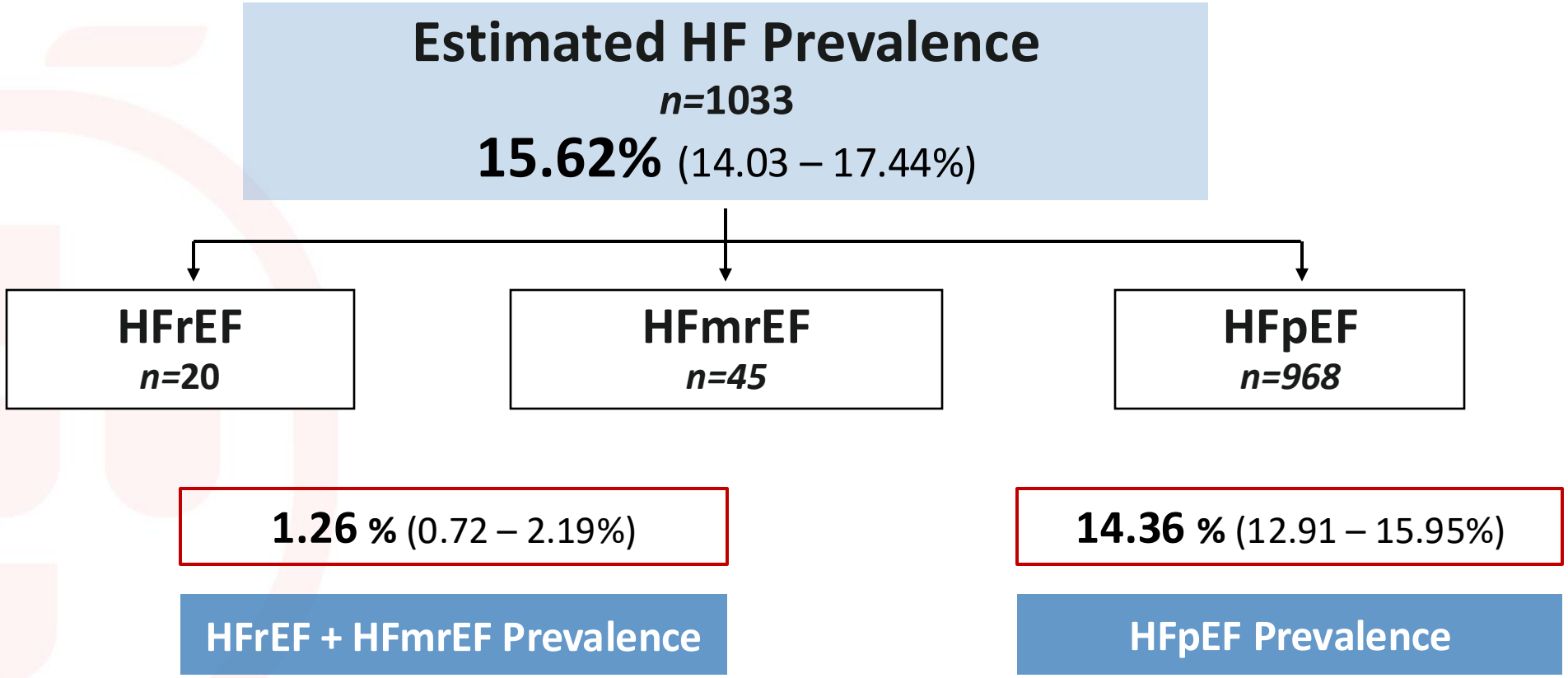

* **HFpEF mimics**: VHD, infiltrative cardiomyopathy, hypertrophic cardiomyopathy, pericardial disease, or high-output HF

RESULTS

HF Prevalence by sex and age

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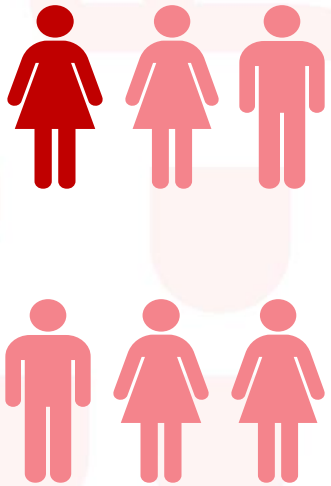
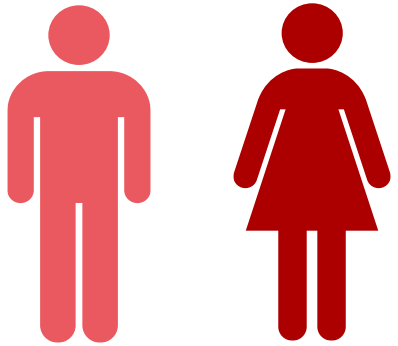
773 726 patients



1 out of 6
with 50+ live with HF

Prevalence by sex (%)

Men: n=206 916; Women: n=566 690



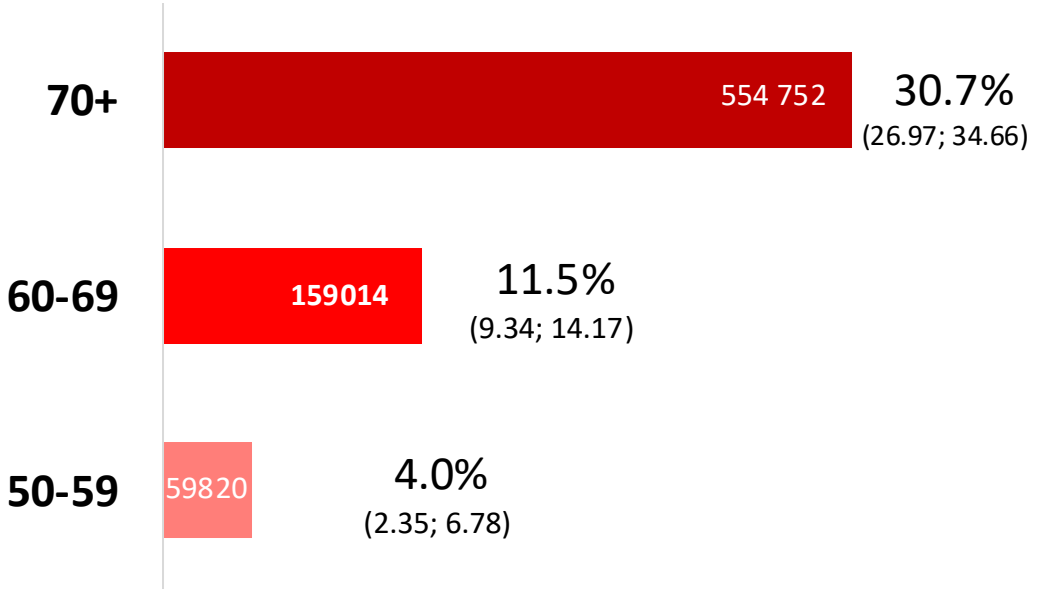
10.44% (8.78; 12.37)

21.02% (18.43; 23.87)

Crude OR: 2.28*
(95%CI:1.77; 2.94; p< 0.001)

* ref men

Prevalence by age (%)



60-69 OR: 3.12 ** (95%CI:1.71; 5.70; p< 0.001)

70+ OR: 10.58 ** (95%CI:5.91; 18.85; p< 0.001)

** ref 50-59 y

RESULTS

Prior HF diagnosis

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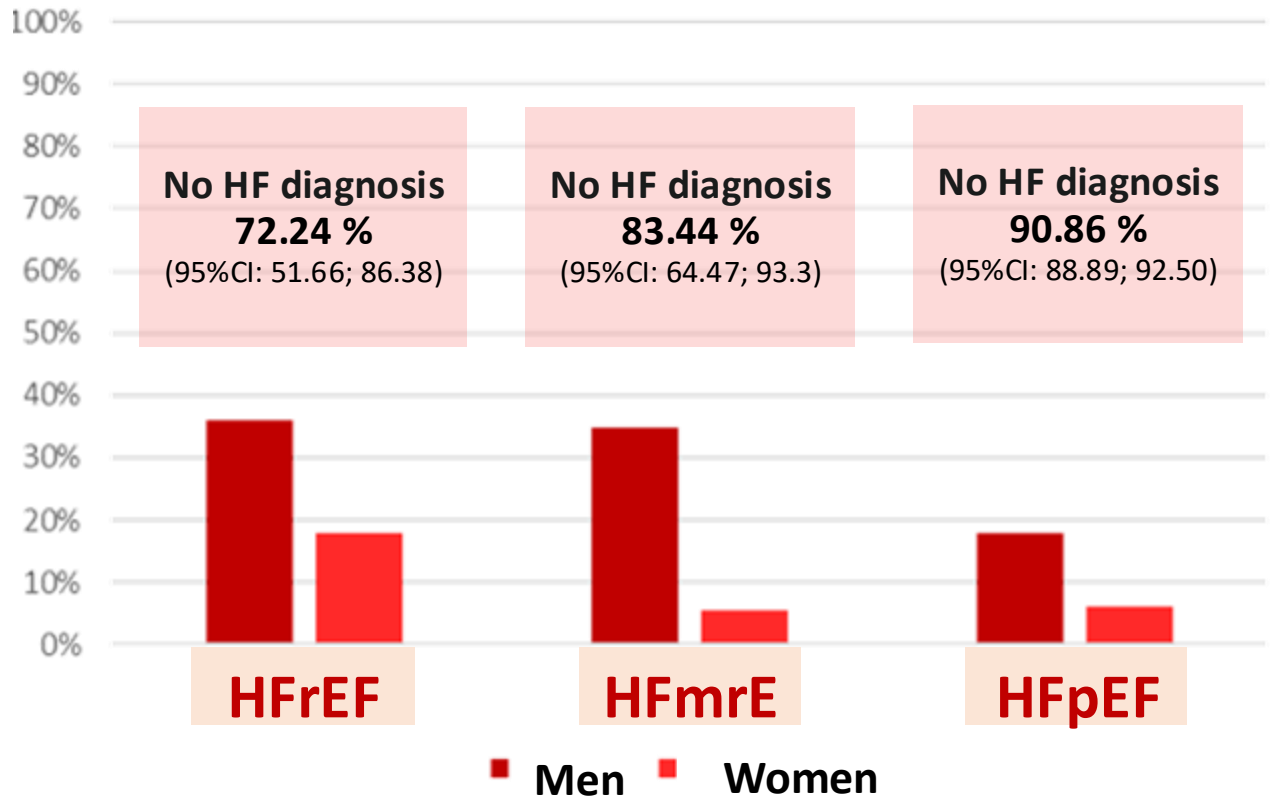
Estimated Prevalence of no previous diagnosis of HF
90.02 %
(95%CI:88.04; 91.71)

9 out of 10 patients were unaware of their condition

Self-reported previous diagnosis of HF (%)



Undiagnosed cases is higher in **women** and in the **age group of 70 and older**

RESULTS

Sample characteristics

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	HFrEF + HFmrEF (EF<50%) n=75	HFpEF (EF ≥50%) n=1061
Age 70+ (%)	42.9%	74.2%
Male sex (%)	42.3%	25.4%
Obesity (BMI ≥30 $kg.m^{-2}$) (%)	28.6%	30.5%
T2D (%)	22.3%	25.4%
Arterial hypertension (%)	83.6%	76.0%
Previous MI (%)	22.6%	6.5%
Atrial fibrillation (%)	22.3%	7.4%
NYHA III-IV (%)	50.8%	24.1%

RESULTS

Sample characteristics

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	HFrEF + HFmrEF n=75	HFpEF n=1061
eGFR mL.min.1.73 m^{-2}, median [P25-P75]	78.03 [66.81-85.11]	75.42 [59.44-90.04]
NT-proBNP (point of care) $ng.L^{-1}$, median [P25-P75]	449 [126-825]	277 [183-499]
Ejection fraction (%) median [P25-P75]	42.33 [39.8-45.53]	63.25 [59.43-67.19]
Left atrial volume index $mL.m^{-2}$, median [P25-P75]	52.12 [50.27-63.10]	46.31 [41.67-53.5]
E' septal $m.s^{-1}$, median [P25-P75]	0.07 [0.05-0.08]	0.06 [0.05-0.07]
E/e' median [P25-P75]	9.26 [5.74-12.43]	10.74 [9.01-13.10]

RESULTS

Results of the KCCQ questionnaire: HF vs non-HF

	Non- HF 1363	HF *n*=1136	Crude ß Non-HF vs HF [95% CI]	Crude p-value Non-HF vs HF	Adjusted ß Non-HF vs HF [95% CI]	Adjusted p-value Non-HF vs HF
KCCQ Summary scores (0-100)						
Clinical, (mean ± sd)	**92.72** (11.25)	**79.84** (17.84)	-16.208 (-18.192; -14.225)	<0.001	-10.201 (-12.452; -7.951)	<0.001
Overall, (mean ± sd)	**92.33** (10.80)	**79.13** (17.31)	-15.028 (-16.711; -13.346)	<0.001	-9.401 (-11.454; -7.348)	<0.001

Adjusted for: gender, age strata, NUTSII, education level, employment status, BMI, smoking habits, alcohol consumption and number of chronic diseases

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Conclusions

CONCLUSIONS

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We used a **contemporary definition of HF** according to the ESC/Universal Definition of HF criteria and HFA-PEFF score for those with symptoms + NT-proBNP ≥125 pg/mL and EF ≥ 50%.

Primary objective:

The **estimated prevalence of HF** in the population **50+** in mainland Portugal was **16.54%** (14.88 – 18.35%).

Secondary objectives:

HFpEF is the dominant phenotype, with an estimated prevalence of **15.22 %** (13.73 – 16.84%).

9 out of 10 patients were **unaware** of their condition.

Prevalence in **women is 2.3 times higher** than in men.

There is a steep increase with age, reaching **~30% in those 70+.**

BATE CERTO CORAÇÃO

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We are deeply grateful to all participants of the PORTHOS study

PROMOTORES

Sociedade Portuguesa de CARDIOLOGIA

AstraZeneca

NOVA MEDICAL SCHOOL

COM O ALTO PATROCÍNIO DE SUA EXCELÊNCIA O Presidente da República

PARCEIROS

MARIA

globalsport

MISSÃO CONTINENTE

Unilabs