

Web Material

Harmonization of Respiratory Data From Nine US Population-Based Cohorts: The NHLBI Pooled Cohorts Study

Elizabeth C. Oelsner, Pallavi P. Balte, Pat Cassano, David Couper, Paul L. Enright, Aaron R. Folsom, John Hankinson, David R. Jacobs, Jr., Ravi Kalhan, Robert Kaplan, Richard Kronmal, Leslie Lange, Laura R. Loehr, Stephanie J. London, Ana Navas Acien, Anne B. Newman, George T. O'Connor, Joseph E. Schwartz, Lewis J Smith, Fawn Yeh, Yiyi Zhang, Andrew E. Moran, Stanford Mwasongwe, Wendy B. White, Sachin Yende, and R. Graham Barr

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Web Table 1. Harmonized Variable List, the NHLBI Pooled Cohorts Study.

Variable name	Label
Identifying data	
newid	Unique id for participants from all cohorts
study	Name of cohort, categorical: aric, card, chs, habc, fhs, mesa, hchs/sol, shs
exam	Exam/visit
Socio-demographics	
age	Age (years), time variant
age_baseline	Age at baseline, exam 1
age_spiro_baseline	Age at first spirometry exam
bmi	Body mass index, time variant
edu_cat	Highest education at baseline:0=No schooling,1=Grades 1-8,2=Grades 9-11,3=High school,4=Some college,5=Bachelor degree,6=Graduate degree
gender	Gender: 1=Male, 0=Female
race	Race: 1=White, 2=Asian, 3=Black, 4=Hispanic/Latino, 5= American Indian, 6=Other
race_black	Black: 1=Yes, 0=No
race_chinese	Asian:1=Yes, 0=No
race_hispanic	Hispanic/Latino:1=Yes, 0=No
race_amind	American Indian:1=Yes, 0=No
race_others	Other Race:1=Yes, 0=No
race_pacific	Pacific Islander:1=Yes, 0=No
race_white	White: 1=Yes, 0=No
Anthropometry	
ht_cm	Height (cms), time variant
wt_kg	Weight (KG), time variant
Spirometry	
pre_fev1	Forced expiratory volume in one sec (L), time variant
pre_fev1_qc_150	Validity assessment for FEV1 using 2005 ATS/ERS standard: 1=Yes (A,B), 0=No (C,D,F); 2 acceptable curves reproducible within 150 mL
pre_fev1_qc_200	Validity assessment for FEV1 using 1994 ATS/ERS standard: 1=Yes (A,B,C), 0=No (D,F); 2 acceptable curves reproducible within 200 mL
pre_fev1_qc_grade	Quality assessment grade for FEV1: A, B, C, D, or F
pre_fev1fvc	Ratio of fev1 over fvc (%), time variant

pre_fev1fvc_qc_150	Validity assessment for FEV1/FVC using 2005 ATS/ERS standard: 1=(pre_fev1_qc_150=1 and pre_fvc_qc_150=1); 0=(pre_fev1_qc_150=0 or pre_fvc_qc_150=0)
pre_fev1fvc_qc_200	Validity assessment for FEV1/FVC using 1994 ATS/ERS standard: 1=(pre_fev1_qc_200=1 and pre_fvc_qc_200=1); 0=(pre_fev1_qc_200=0 or pre_fvc_qc_200=0)
pre_fvc	Forced vital capacity (L), time variant
pre_fvc_qc_150	Validity assessment for FVC using 2005 ATS/ERS standard: 1=Yes (A,B), 0=No (C,D,F); 2 acceptable curves reproducible within 150 mL
pre_fvc_qc_200	Validity assessment for FVC using 1994 ATS/ERS standard: 1=Yes (A,B,C), 0=No (D,F); 2 acceptable curves reproducible within 200 mL
pre_fvc_qc_grade	Quality assessment grade for FVC: A, B, C, D, or F
timefactor_spiro	Time from baseline spirometry exam, years

Events

SOLE	Severe Obstructive Lung Event (SOLE): Death or hospitalization with CLRD adjudicated as primary/underlying cause or CLRD ICD-coded as primary discharge diagnosis or underlying cause of death; 1=Yes, 0=No
tty_SOLE	Time to Severe Obstructive Lung Event (SOLE), years since baseline
clrd_related_event	CLRD-related event: Death or hospitalization with CLRD adjudicated as contributing cause or CLRD ICD-coded in any position; 1=Yes, 0=No
tty_clrd_related_event	Time to CLRD-related event, years since baseline
death	All-cause mortality: 1=Yes, 0=No
tty_death	Time to all-cause mortality, years since baseline
clrd_death	Deaths with CLRD adjudicated as the underlying cause or CLRD ICD-coded as the underlying cause of death: 1=Yes, 0=No
clrd-related_death	Deaths with CLRD adjudicated as a contributing cause or CLRD ICD-coded as a cause of death in any position: 1=Yes, 0=No

Medical history

pmh_asthm_age_start_base	Age when asthma started at baseline:1=Yes, 0=No
pmh_asthma_ever_base	Self reported asthma ever at baseline:1=Yes, 0=No
pmh_asthma_md_base	Doctor diagnosed asthma at baseline:1=Yes, 0=No
pmh_asthma_still_base	Still have asthma at baseline:1=Yes, 0=No
pmh_cbronch_age_start_base	Age when chronic bronchitis started at baseline:1=Yes, 0=No
pmh_cbronchitis_ever_base	Self reported chronic bronchitis ever at baseline:1=Yes, 0=No
pmh_cbronchitis_md_base	Doctor diagnosed chronic bronchitis at baseline:1=Yes, 0=No
pmh_cbronchitis_still_base	Still have chronic bronchitis at baseline:1=Yes, 0=No
pmh_diabetes_md_base	Doctor diagnosed diabetes at baseline:1=Yes, 0=No
pmh_emph_age_start_base	Age when emphysema started at baseline:1=Yes, 0=No

pmh_emphysema_ever_base Self reported emphysema ever at baseline:1=Yes, 0=No

pmh_emphysema_md_base Doctor diagnosed emphysema at baseline:1=Yes, 0=No

pmh_emphysema_still_base Still have emphysema at baseline:1=Yes, 0=No

Symptoms

Sx_MRC_CB MRC chronic bronchitis (calculated), time variant

Sx_MRC_dyspnea MRC dyspnea scale (calculated), time variant

Sx_cough Have a cough, time variant:1=Yes, 0=No

Sx_cough_3months Cough on most days for 3 consecutive months, time variant:1=Yes, 0=No

Sx_cough_4days Cough 4-6 times/day for 4 or more days, time variant:1=Yes, 0=No

Sx_cough_day_night Cough at all during day or night, time variant:1=Yes, 0=No

Sx_cough_getup Cough at all on getting up, time variant:1=Yes, 0=No

Sx_cough_years Number of years had this cough

Sx_phlegm Bring up phlegm, time variant:1=Yes, 0=No

Sx_phlegm_3months Phlegm on most days for 3 consecutive months, time variant:1=Yes, 0=No

Sx_phlegm_4days Phlegm 4-6 times/day for 4 or more days, time variant:1=Yes, 0=No

Sx_phlegm_day_night Phlegm at all during day or night, time variant:1=Yes, 0=No

Sx_phlegm_getup Phlegm at all on getting up, time variant:1=Yes, 0=No

Sx_phlegm_years Number of years had this phlegm

Sx_sob_100yards Shortness of breath after walking about 100 yards (or after a few minutes) on the level, time variant:1=Yes, 0=No

Sx_sob_noact Too breathless to leave the house or breathless on dressing or undressing, time variant:1=Yes, 0=No

Sx_sob_pace Stop for breath when walking at our own pace on the level, time variant:1=Yes, 0=No

Sx_sob_slow_peers Walk slower than people of your age on the level because of breathlessness, time variant:1=Yes, 0=No

Sx_sob_uphill Troubled by shortness of breath when hurrying on the level or walking up a slight hill, time variant:1=Yes, 0=No

Sx_wheeze_cold Wheezing / whistling in chest when have cold, time variant:1=Yes, 0=No

Sx_wheeze_most_days Wheezing / whistling in chest on most days or nights, time variant:1=Yes, 0=No

Sx_wheeze_nocold Wheezing / whistling in chest without cold, time variant:1=Yes, 0=No

Sx_wheeze_sob Shortness of breath with wheezing attack, time variant:1=Yes, 0=No

Sx_wheeze_years Number of years with wheezing / whistling in chest

Medications

meds_bronc_dilator Medications: Bronchodilators, time variant:1=Yes, 0=No

meds_steroids Medications: Steroids, time variant:1=Yes, 0=No

Smoking

smoking_cigs_perday Cigarettes smoked per day

smoking_cigs_perday_base Cigarettes smoked per day at baseline visit

smoking_current Current smoker, time variant:1=Yes, 0=No

smoking_current_baseline Current smoker at baseline:1=Yes, 0=No

smoking_ever Ever smoker, time variant:1=Yes, 0=No

smoking_ever_baseline Ever smoker at baseline:1=Yes, 0=No

smoking_former Former smoker, time variant:1=Yes, 0=No

smoking_former_baseline Former smoker at baseline:1=Yes, 0=No

smoking_packyears Cigarettes pack years, time variant

smoking_packyears_baseline Cigarettes pack years at baseline visit

smoking_status 3 levels of smoking status, time variant:0=Never, 1=Former, 2=Current

smoking_status_baseline 3 levels of smoking status at baseline:1=Yes, 0=No

Web Table 2. Respiratory Data Completeness, the NHLBI Pooled Cohorts Study, 1983-2016.

Participants in NHLBI PCS				
<i>n</i> = 65,251				
	Complete and valid		Missing or invalid	
	No.	%	No.	%
Standard covariates				
Age	65,250	100.0	1	0.0
Sex	65,251	100.0	0	0.0
Race/ethnicity	65,251	100.0	0	0.0
Height (cms)	65,165	99.9	86	0.1
Body mass index (kg/m2)	65,098	99.8	153	0.2
Education	63,833	97.8	1,418	2.2
Smoking status	65,056	99.7	195	0.3
Pack years of smoking at baseline	63,538	97.4	1,71	2.6
Chronic lung disease				
Self-reported diagnosis	62,943	96.5	2,308	3.5
Dyspnea	64,021	98.1	1,230	1.9
Chronic bronchitis ^a	58,091	89.0	7,160	11.0
FEV1	55,013	84.3	10,238	15.7
FVC	54,387	83.4	10,864	16.6
CLRD events follow-up				
CLRD mortality	37,982	58.2	27,269 ^b	41.8
CLRD hospitalization	29,352	45.0	35,899 ^b	55.0

CLRD = chronic lower respiratory disease; FEV1 = forced expiratory volume in one second; FVC = forced vital capacity; PCS = Pooled Cohorts Study.

^aDefined by mMRC criteria as cough for at least consecutive 3 months for the last 2 years. Among 11.6% of the sample, in which the mMRC questions were incompletely administered and missing the question of how many years of cough, endorsement of cough for at least consecutive 3 months was classified as chronic bronchitis.

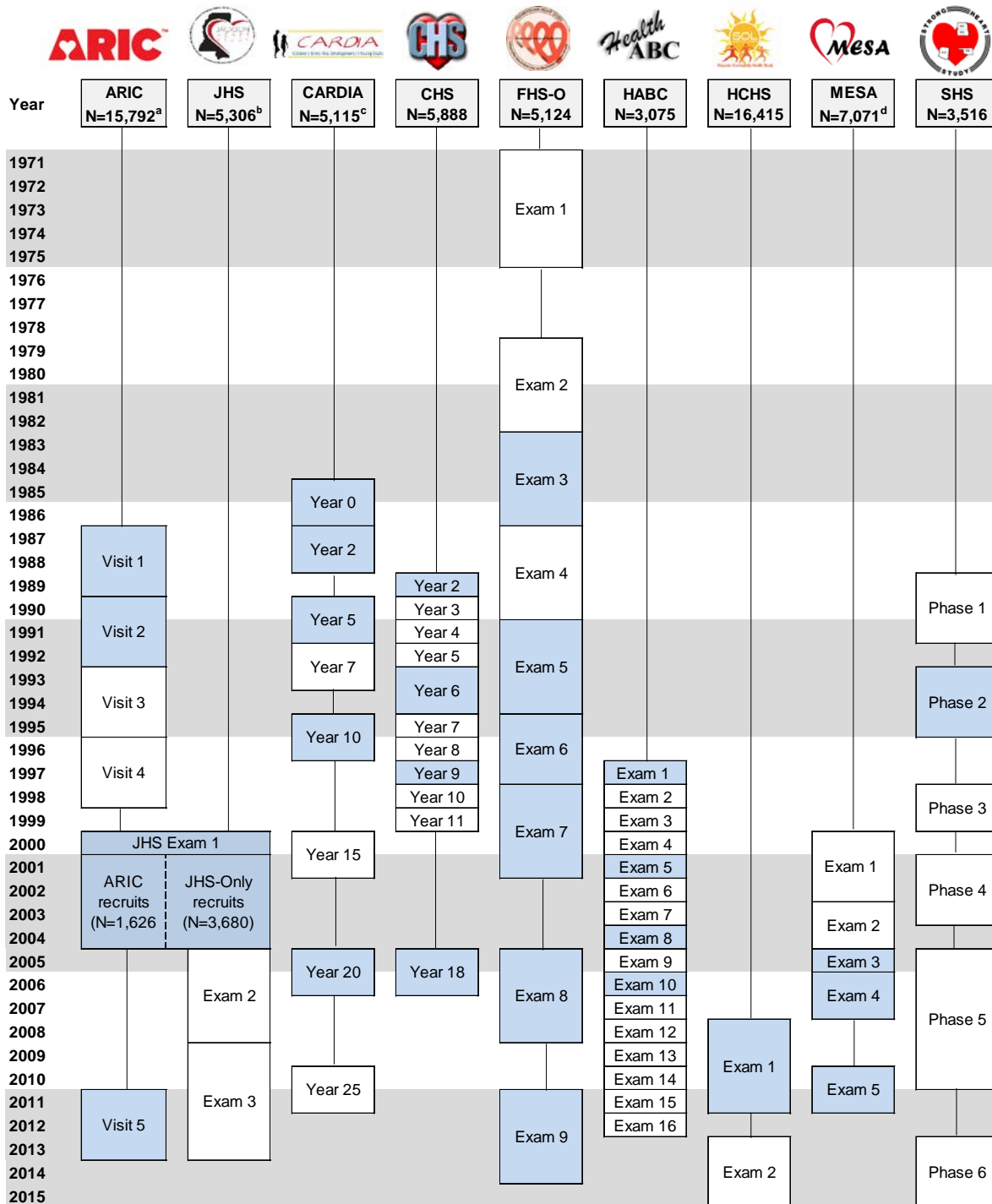
^bCLRD mortality were not defined in two cohorts (FHS, JHS) and CLRD hospitalizations were not defined in 4 out of 9 cohorts (CARDIA, FHS, JHS, SHS). Although HCHS/SOL is ascertaining CLRD mortality, hospitalizations, and Emergency Department visits, these data were not available at time of manuscript preparation (March 2018).

Web Table 3. Within- and Between-Individual Variability in Spirometry Measures According to Harmonized Quality Rubric, the NHLBI Pooled Cohorts Study, United States, 1983-2016.

		All available spirometry	Spirometry grade				
			A	B	C	D	F
N, participants		59,508	38,059	26,448	4,699	6,196	3,364
N, spirometry		120,933	65,294	40,402	4,939	6,643	3,655
N, repeated		31,208	13,126	12,743	229	436	259
FEV1							
	Mean (SD)	2.69 (0.88)	2.71 (0.91)	2.69 (0.79)	2.48 (0.93)	2.60 (0.90)	2.63 (1.02)
	Variance						
	Within-individual	0.11	0.06	0.07	0.08	0.17	0.15
	Between-individual	0.48	0.48	0.50	0.46	0.45	0.52
	ICC	0.82	0.89	0.87	0.85	0.73	0.78
	Outliers, N (%)	1,443 (1.19)	755 (1.16)	510 (1.26)	70 (1.42)	82 (1.23)	54 (1.48)
	>15% annual increase, N (%)	68 (0.22)	9 (0.07)	10 (0.08)	2 (0.87)	2 (0.46)	5 (1.93)
FVC							
	Mean (SD)	3.52 (1.07)	3.50 (1.09)	3.61 (1.01)	3.22 (1.11)	3.41 (1.13)	3.48 (1.26)
	Variance						
	Within-individual	0.15	0.08	0.11	0.11	0.29	0.23
	Between-individual	0.78	0.77	0.83	0.79	0.74	0.90
	ICC	0.84	0.90	0.88	0.87	0.72	0.80
	Outliers, N (%)	1,573 (1.30)	858 (1.31)	478 (1.18)	80 (1.62)	90 (1.35)	38 (1.04)
	>15% annual increase, N (%)	47 (0.15)	8 (0.06)	5 (0.04)	1 (0.44)	4 (0.92)	6 (2.32)

FEV1 = forced expiratory volume in one second; FVC = forced vital capacity; ICC = intra-class correlation; SD = standard deviation.

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^a 424 gave restricted consent

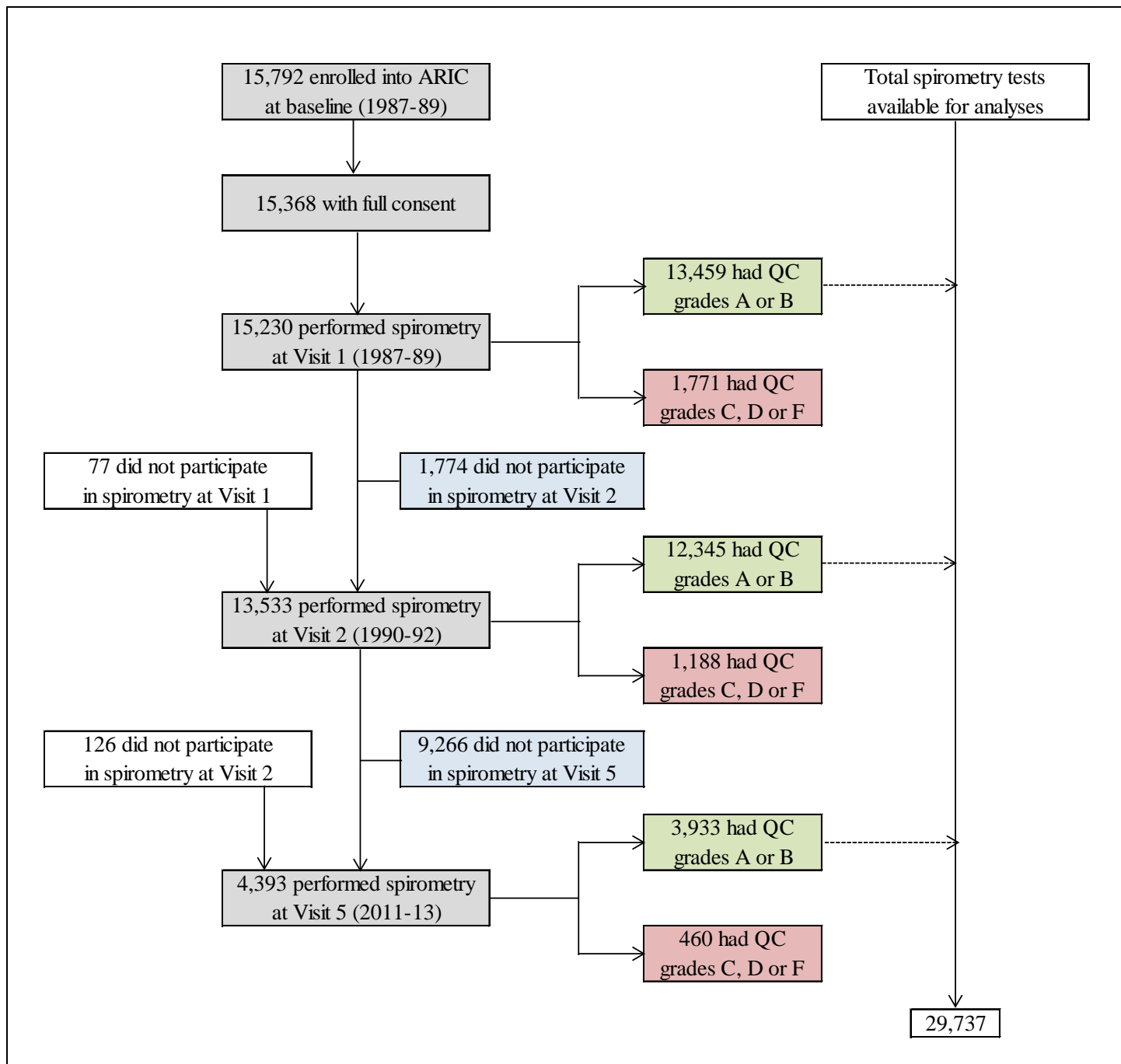
^b Includes 1,626 participants recruited from ARIC

^c Withdrawal of consent by one participant

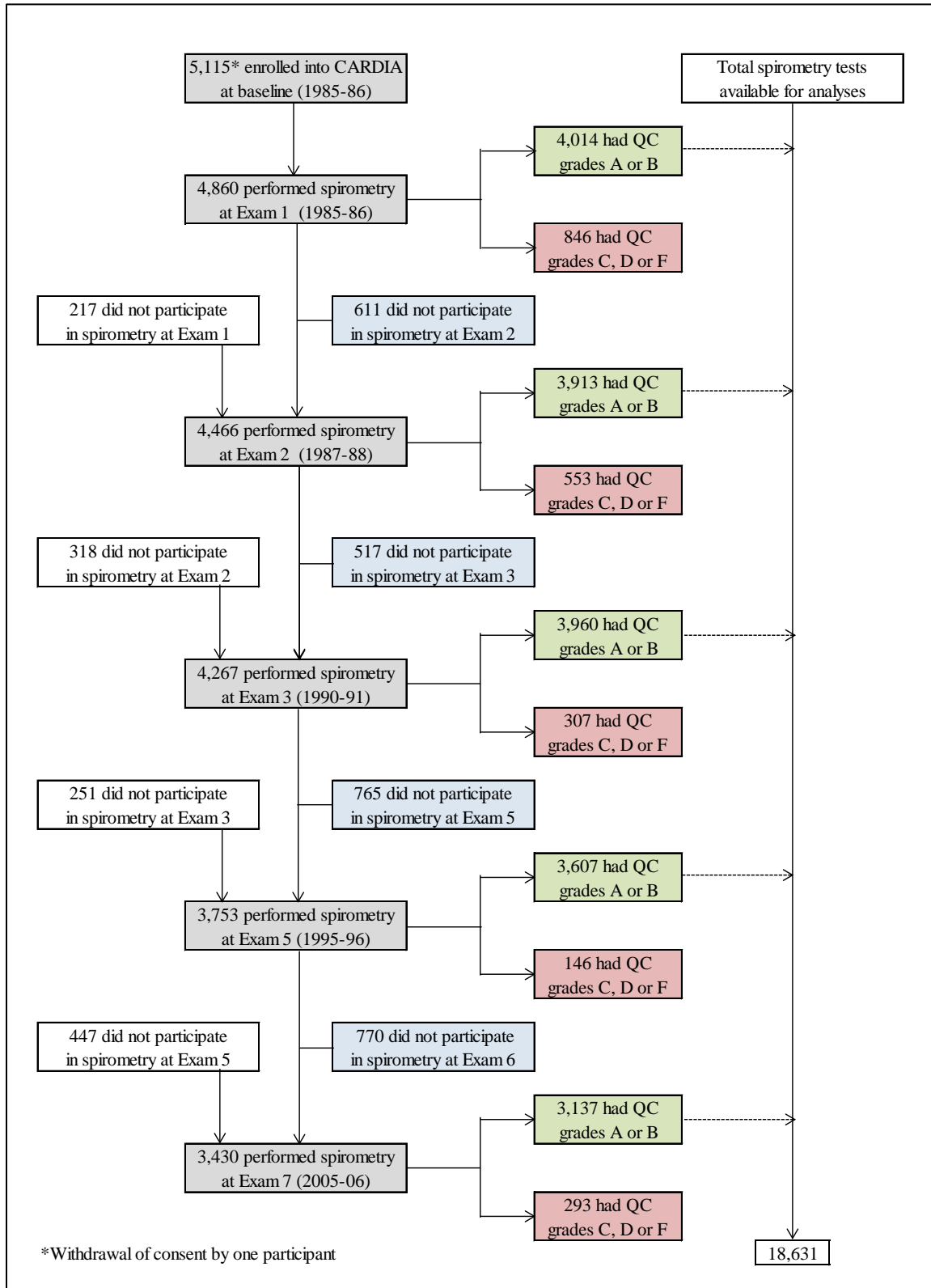
^d MESA + 257 new recruits into the MESA Air Pollution Study

Visit with Spirometry

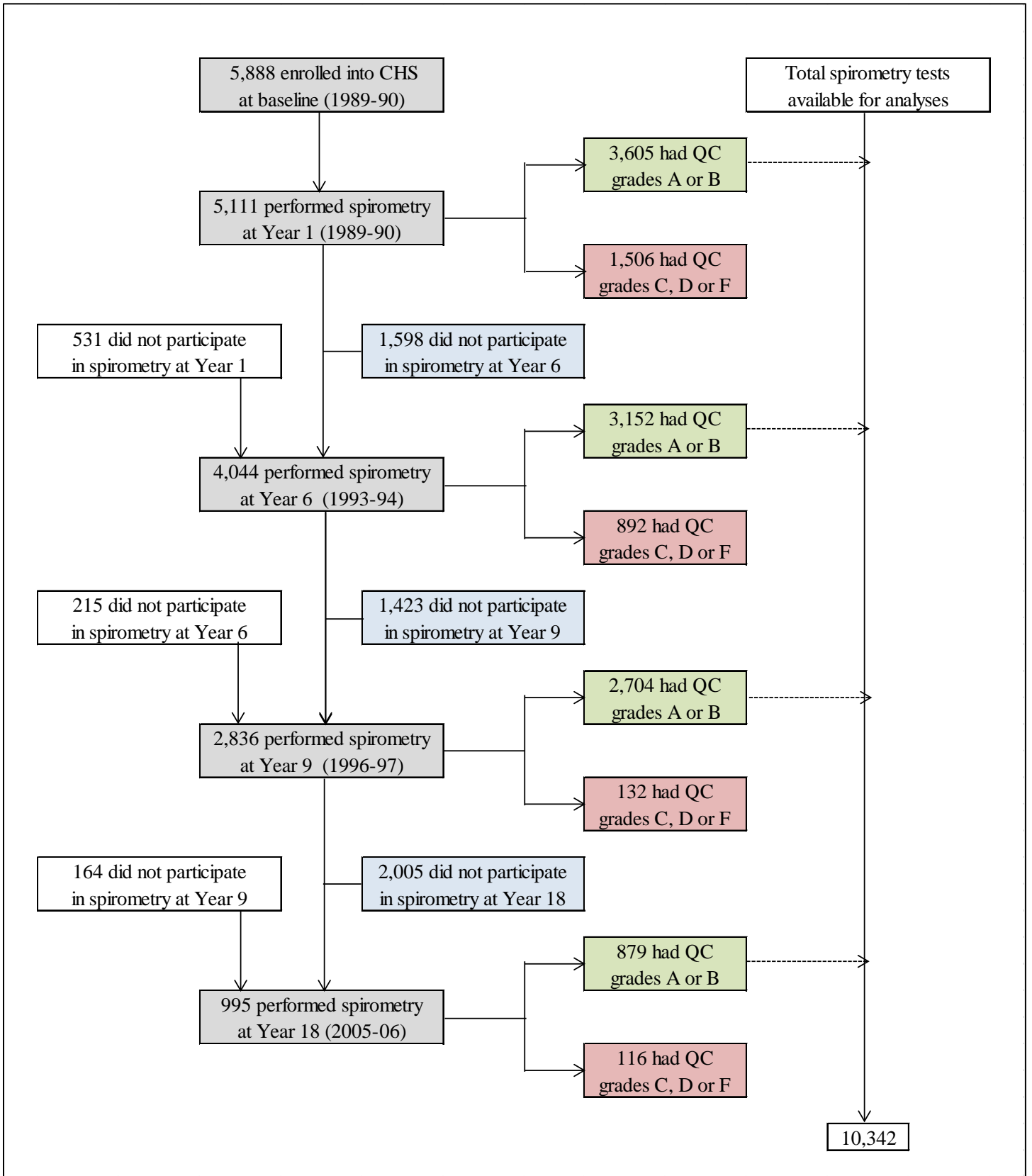
Web Figure 2. Flow Chart of Longitudinal Lung Function Data in the Atherosclerosis Risk In Communities Study, by Visit, United States, 1989-2013.



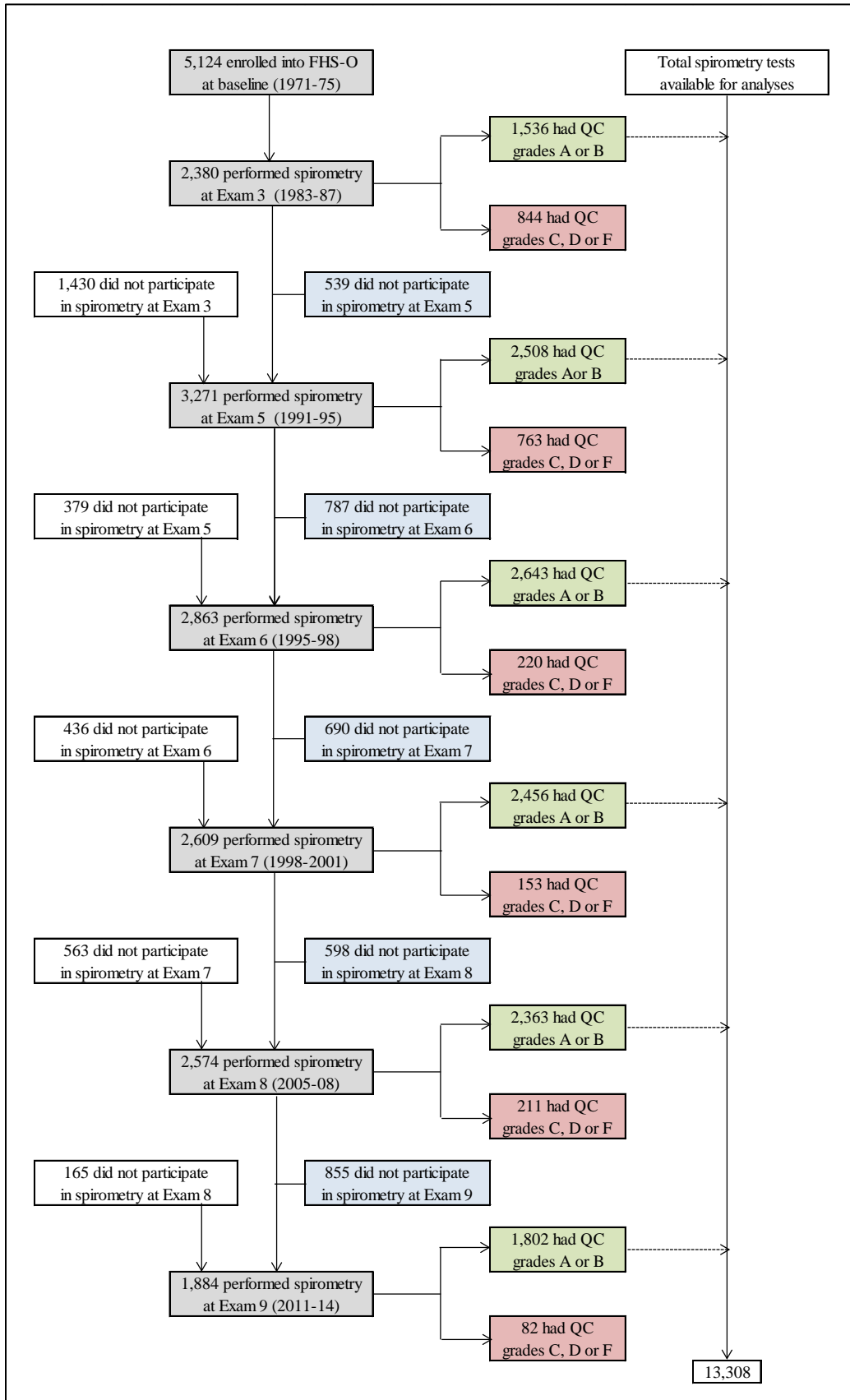
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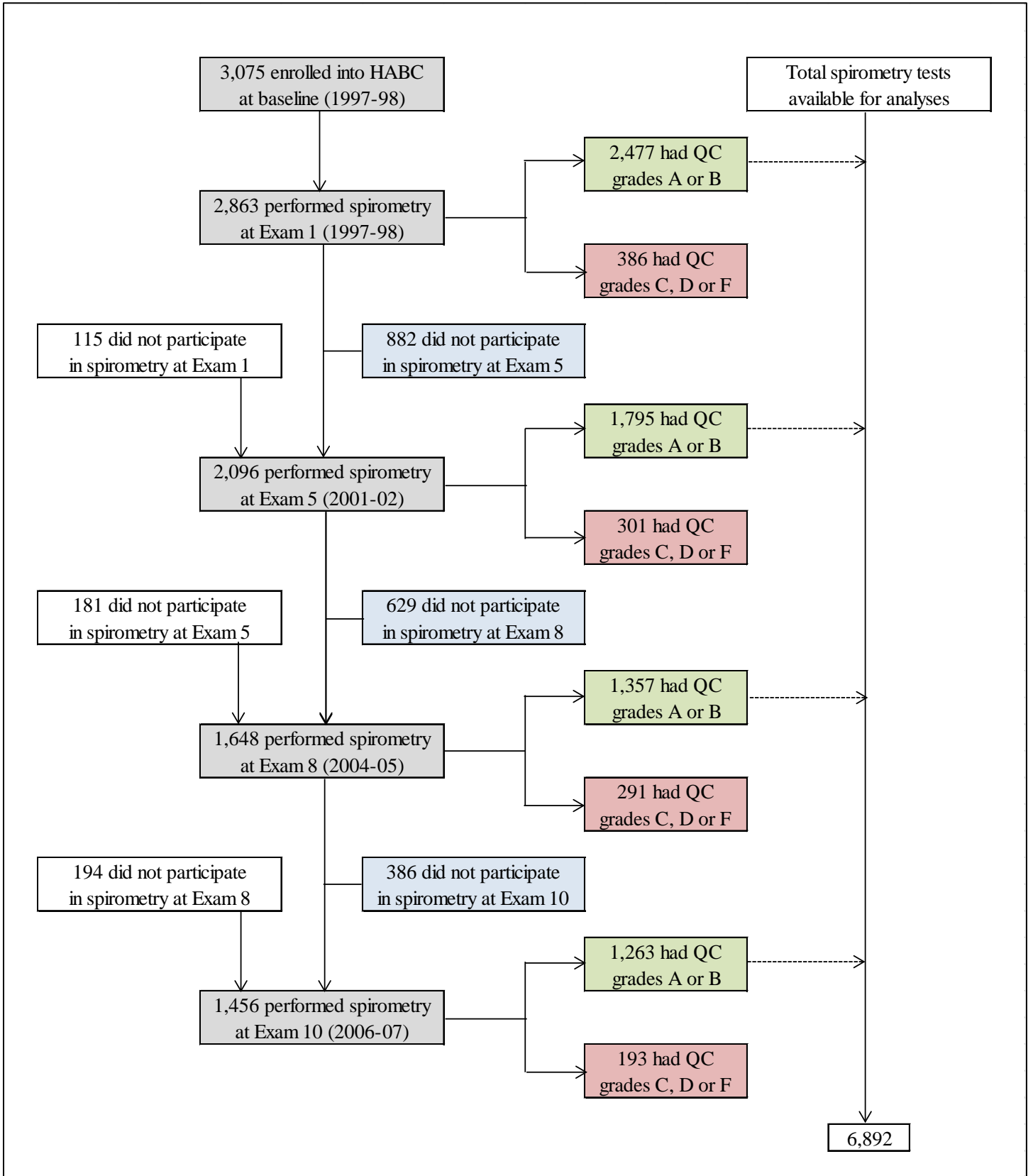
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