

Nya referensvärden för spirometri

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ERS/ATS technical standard on interpretive strategies for routine lung function tests

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Shareable abstract (@ERSpublications)

Data from pulmonary function tests must be complemented with clinical expertise and consideration of the inherent biological variability and uncertainty of the test result to ensure appropriate interpretation of an individual's lung function measurements <https://bit.ly/3ecluFc>

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Plan

Referensvärden i perspektiv

- 80% vs. 5:e percentilen/LLN/ $-1,64$

Nya och gamla referensvärden

Exempel implementering Sachsska

Vad är ett referensvärde?

Uppslagsverket

Sök i uppslagsverket ...



referensvärde

referensvärde, jämförelsevärde som behövs när man skall tolka resultatet av analytisk verksamhet.

Ref: ne.se

Referensområde:
det intervall där det är vanligast för (friska) att befinna sig

Hur gör man ett referensvärde?

Undersök många friska personer

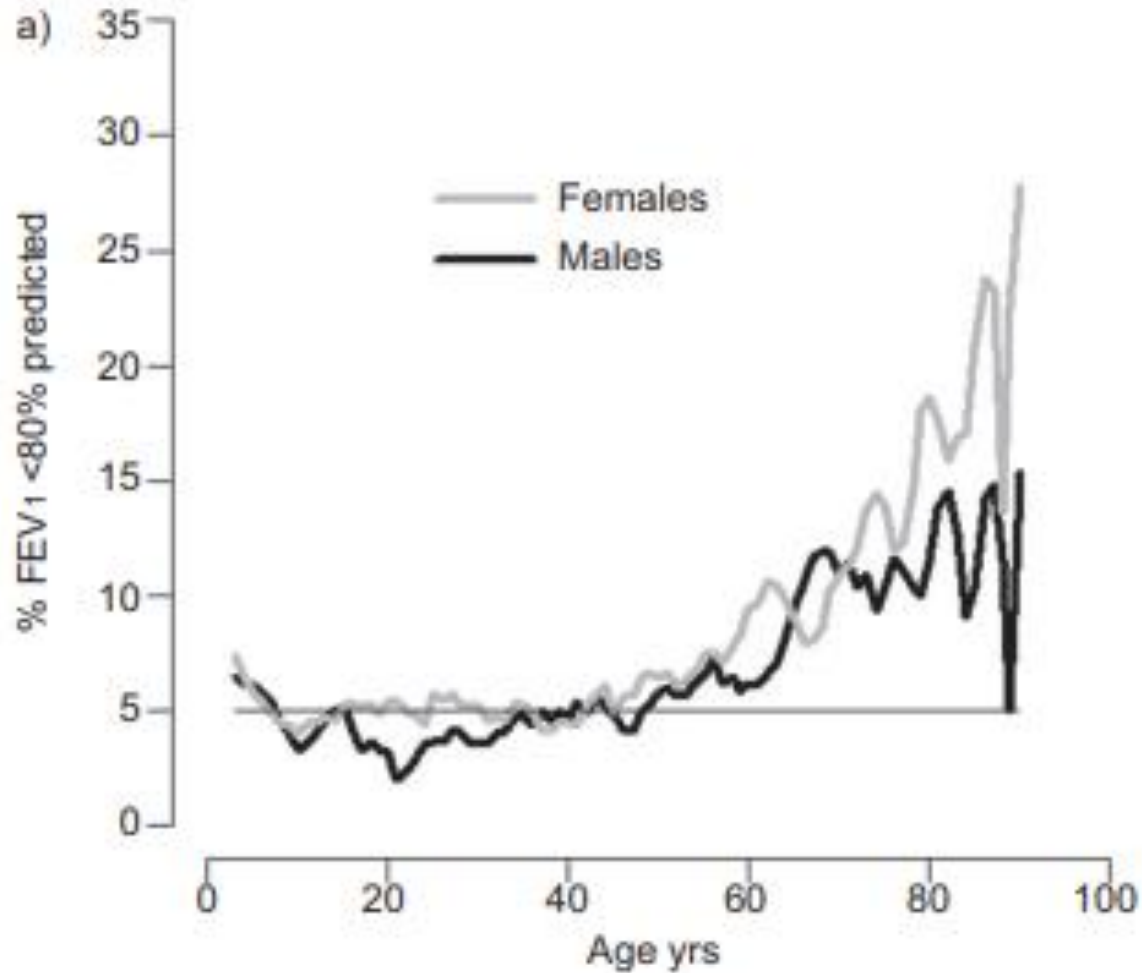
Se vilka faktorer som påverkar referensvärdet

Se vilka faktorer som påverkar referensintervallet

Sätt en gräns för vad som är statistiskt ovanligt hos friska(!)

Spirometri – LLN, de lägsta 5 %, under -1,64 z-score

Varför inte 80%?



Referensvärden för spirometri

Zapletal 1977

111 barn
6-17 år

Solymar 1980

140 barn
7-18 år

Hedenström 1986

200 vuxna
20-78 år

Quanjer 2012
(GLI)

96.000 ind.
3-95 år



ERS TASK FORCE

Multi-ethnic reference values for spirometry for the 3–95-yr age range: the global lung function 2012 equations

Philip H. Quanjer, Sanja Stanojevic, Tim J. Cole, Xaver Baur, Graham L. Hall, Bruce H. Culver, Paul L. Enright, John L. Hankinson, Mary S.M. Ip, Jinping Zheng, Janet Stocks and the ERS Global Lung Function Initiative

ABSTRACT: The aim of the Task Force was to derive continuous prediction equations and their lower limits of normal for spirometric indices, which are applicable globally. Over 160,000 data points from 72 centres in 33 countries were shared with the European Respiratory Society Global Lung Function Initiative. Eliminating data that could not be used (mostly missing ethnic group, some outliers) left 97,759 records of healthy nonsmokers (55.3% females) aged 2.5–95 yrs.

Lung function data were collated and prediction equations derived using the LMS method, which allows simultaneous modelling of the mean (μ), the coefficient of variation (σ) and skewness (λ) of a distribution family.

After discarding 23,572 records, mostly because they could not be combined with other ethnic or geographic groups, reference equations were derived for healthy individuals aged 3–95 yrs for Caucasians ($n=57,395$), African-Americans ($n=3,545$), and North ($n=4,992$) and South East Asians ($n=8,255$). Forced expiratory value in 1 s (FEV_1) and forced vital capacity (FVC) between ethnic groups differed proportionally from that in Caucasians, such that FEV_1/FVC remained virtually independent of ethnic group. For individuals not represented by these four groups, or of mixed ethnic origins, a composite equation taken as the average of the above equations is provided to facilitate interpretation until a more appropriate solution is developed.

Spirometric prediction equations for the 3–95-age range are now available that include appropriate age-dependent lower limits of normal. They can be applied globally to different ethnic groups. Additional data from the Indian subcontinent and Arabic, Polynesian and Latin American countries, as well as Africa will further improve these equations in the future.

KEYWORDS: Lower limit of normal, predicted values, spirometry, statistical modelling, z-score

AFFILIATIONS

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GLI

- Längd – proxy för bröstkörg
 - Ålder – pubertet och åldrande
 - Kön – biologiskt
 - Etnicitet – under diskussion
-
- Spridningen är också åldersberoende

GLI

TABLE 1 Characteristics and forced expiratory volume in 1 s (FEV₁), forced vital capacity (FVC) and FEV₁/FVC ratio z-scores of each cohort included in the age groups

Cohorts	Nations	Age groups	n	Age [#]	FEV ₁		FVC		FEV ₁ /FVC ratio	
					GLI fit [#]	Mean-centred [¶]	GLI fit [#]	Mean-centred [¶]	GLI fit [#]	Mean-centred [¶]
ALSPAC [†]	UK	>5–10	6804	8.7±0.3	0.04±1.00	-0.09±1.02	-0.06±1.02	-0.02±1.04	0.15±1.02	-0.10±1.07
		>15–20	4519	15.5±0.3	-0.68±1.29	-0.04±1.26	-1.02±1.29	0.04±1.25	0.61±1.16	-0.14±1.21
		>20–25	3731	24.5±0.8	-0.52±1.01	0.06±1.00	-0.37±1.02	0.13±0.98	-0.27±0.94	-0.1±0.98
BAMSE [‡]	Sweden	>5–10	1832	8.3±0.5	0.47±0.94	-0.06±0.94	0.59±0.90	-0.00±0.91	-0.27±0.87	-0.07±0.89
		>15–20	2052	16.7±0.4	0.06±0.92	-0.11±0.94	0.16±0.92	-0.01±0.92	-0.19±0.93	-0.15±0.96
		>20–25	2032	22.5±0.5	-0.23±0.85	-0.03±0.86	-0.12±0.85	0.07±0.85	-0.20±0.88	-0.15±0.90

Wang ERJ open res 2021

ORIGINAL ARTICLE
LUNG FUNCTION

Global Lung Function Initiative 2012 reference equations for spirometry in the Norwegian population

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CrossMark

Sachsska
barn- och ungdomssjukhuset



SÖS

SÖDERSJUKHUSET

För-emot GLI

För

- Unga barn
- Pubertet
- Övergång till vuxen
- Spridning i olika åldrar
- Gränsvärde även för FEV₁/FVC
- Passar hyfsat

Emot

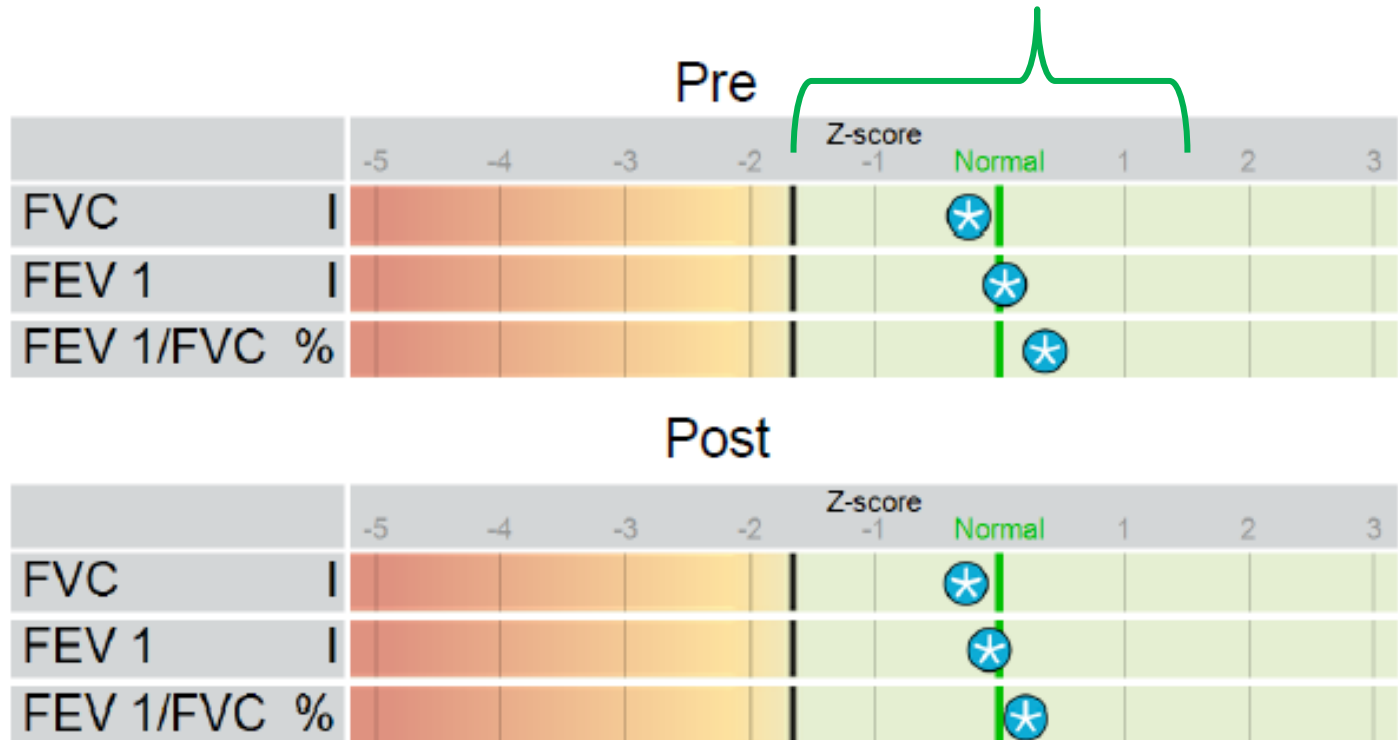
- Ingen referenskurva
- Inte använt på fyslab

Implementering

- Sachsska lung-allergi + 3 barnmottagningar
- Fanns redan i maskinerna
- Manualer för omställning – etnicitet
- Nya rapportblad
- Undervisning i tolkning utan 80%
- Vid behov dubbla referensvärden

spirometri

$\pm 1,64 = 90\%$ av
en frisk befolkning



Sammanfattningsvis

Under referensintervallet spiro – 5% ovanligaste
Ej patologiskt - fysiologiskt mönster

Sachsska nöjda med GLI och z-score

Känn ditt referensvärde

Standardisera och dokumentera