All-age multi-ethnic reference values for spirometry: The global lung function initiative (GLI)

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Background: The GLI (an ERS Task Force) was established to develop the first global reference equations for spirometry. These are the result of unprecedented international cooperation and are endorsed by six international respiratory societies, including the ERS. Methods: Data from 74,187 healthy non-smokers aged 3-95 years were used to derive reference equations using modern statistical methods, including development of age dependent lower limits of normal. Results: All-age reference equations are now available for Caucasians, African Americans, South East Asians (south of the Huaihe River and Qinling Mountains), and North East Asians (north of the Huaihe River and Qinling Mountains). For individuals not represented by these four groups a composite equation is provided. Since the observed ethnic differences were proportional to Caucasians, for groups not represented, samples of healthy subjects, composed of at least 300 individuals, studied according to international standards (Quanjer et al ERJ 2011, 37; 658-664) and with height and age measured accurately to one decimal place (Quanjer et al, ERJ 2012, PM:22183491), can be used to validate the GLI and/or create an appropriate adjustment factor (www.lungfunction.org). Conclusions: The GLI 2012 reference equations are a major step forward and provide a robust reference standard to streamline interpretation of spirometry across all-ages worldwide. Widespread use of the GLI equations will, however, depend on timely implementation by manufacturers of spirometric devices.