

Appendix 6. Association of variables facial dimensions, gender and ethnicity with RPE fit

Studies	Pass rates (PR) Users/RPE groups*	Association between facial dimensions (FD) and fit**	Association between gender and fit**	Association between ethnicity and fit**	Association of mask factors***	Recommendations or conclusions made by authors
Liau et al. (1982) ⁴⁸ US	N/A	low correlation coefficients but greatest for FW and LW	N/A	N/A	N/A	No FD recommendation
Gross and Horstman (1990) ⁴⁹ US	Users: 95% ♂: 83-85% ♀: 71-89% (RPE dependent)	Nose and lip measurements were relevant but no significant correlation	PR for 2/3 RPE models: ♂ > ♀ Comparable PR between genders with >1 RPE models	N/A	variability of FF based on brand for ♀	No FD recommendation. Need to offer variety in RPE model and size.
Oestenstad et al. (1990) ⁵⁰ US	N/A	High prevalence of nose leaks. Significant correlation for NRB, BIOC, LFL to FF.	Association of facial dimension and leak sites attributed to gender. Greater predictability with gender specific models.	N/A	N/A	Consideration for inclusion of nasal dimensions
Oestenstad and Perkins (1992) ²⁷ US	Users: 80.9%	FDs predict fit. LFL alone is a good predictor. FL and NRB are also relevant	Gender based differences in fit predicted by differences in FD. Greater predictability with race/gender specific models	Race specific models improve predictive ability	N/A	Other FDs (i.e. LFL) may be more appropriate
Brazile et al. (1998) ⁵¹ US	Users: 91.9% ♂: 91.2% ♀: 92.6%	NW and NP were associated with FF but account for small percentage of FF variation and were not good predictors of fit	No significant association Comparable FF and PR between genders	Black ♀ : lowest PR No effect on FF	N/A	Fit is associated with individual FD rather than FD associated with gender or ethnicity
Han (2000) ⁵² South Korea	RPE groups: 30.9 - 77.2%	Significant FF variation between facial size categories	Difference in FF scores: ♂ > ♀	Low/moderate PR amongst Korean users ‡	Significant difference in FF and PR between brands	Respirators designed for males may not fit females. FL and LW alone are not good criteria
Han and Choi (2003) ²⁹ South Korea	♂: 58 - 78.6% ♀: 34.2 - 50% (RPE dependent)	FW, NP and BTMA arc are good predictors of fit. No common FD variable across all RPE/gender subgroups	Difference in PR for 2/3 RPE models: ♂ > ♀ Gender-specific models account for most variation in fit factor	Low/moderate PR amongst Korean users ‡	Significance difference in FF and PR between brands	The 3 FD predictive of fit should be considered in designing RPE for Koreans
Kim et al. (2003) ⁵³ South Korea	♂: 41.4 - 87% ♀: 10.3 - 60% (RPE dependent)	♂: No correlation for FD and FF ♀: 5 FD correlate with FF (BTSA, BECTO, BTMA, JW, LFL) FW, LFL, BIOC, BECTO, NL, LW, BTSA predict PR/fit (gender/RPE dependent)	Difference in FF and PR: ♂ > ♀ Greater predictability with gender specific models	Low/moderate PR amongst Korean users ‡	Significance difference in FF and PR between brands	Consideration of alternative FD in design of quarter mask respirators for Koreans
Zhuang et al. (2005) ⁵⁴	N/A	16/33 models of RPE model/size combinations show association of	Comparable FF between genders for 16/18 RPE models	N/A	FF associated with number of sizes per	FL and FW are recommended for defining the panel