$$iTFR = \frac{\beta - \alpha}{n} \cdot \frac{C}{W}$$

$$C = iTFR \cdot \frac{W}{\beta - \alpha} \cdot n$$

$iTFR$ is "implied TFR" – this is from Hauer, Schmertmann (2019), and Hauer, Baker, Brown (2013), where:
$\beta - a$ is childbearing ages
n is age group sizes
C is the youngest age group
W is women in childbearing ages

Youngest-age-group, using iTFR (Hauer and Schmertmann (2019); and Hauer, Baker, and Brown (2013)).

-"Population pyramids yield accurate estimates of total fertility rates" Hauer and Schmertmann (2019): https://osf.io/adu98/
-"Indirect Estimates of Total Fertility Rate Using Child Woman/Ratio: A Comparison with the Bogue-Palmore Method" Hauer, Baker, and Brown (2013): https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0067226
-More info/thoughts at: https://github.com/edyhsgr/CCRStable/blob/master/Oct2020Presentation/EddieH_FSU_Oct2020.pdf

$$RAdjS_{x,t} = R_{x,t} + S_{x,t} - S_{x,0}$$

$RAdjS_{x,t}$ is the mortality-adjusted cohort change ratio for age-by-sex x, at time t
$R_{x,t}$ is the unadjusted cohort change ratio for age-by-sex x, at time t
$S_{x,t}$ is the imputed survivorship factor for age-by-sex x, at time t
$S_{x,0}$ is the imputed survivorship factor for age-by-sex x, at time 0

Mortality adjustment.

-More info/thoughts at:
https://github.com/edyhsgr/CCRStable/blob/master/Oct2020Presentation/EddieH_FSU_Oct2020.pdf

$$RAdjG_{x,t} = (R_{x,t} - S_{x,t}) \cdot I_t + S_{x,t}$$

$RAdjG_{x,t}$ is the gross migration-adjusted cohort change ratio for age-by-sex x, at time t
$R_{x,t}$ is the unadjusted cohort change ratio for age-by-sex x, at time t
$S_{x,t}$ is the imputed survivorship factor for age-by-sex x, at time t
I_t is the gross migration adjustment factor (centered on 1), at time t

Gross migration adjustment – to manage the intensity of migration.

-More info/thoughts at:
https://github.com/edyhsgr/CCRStable/blob/master/Oct2020Presentation/EddieH_FSU_Oct2020.pdf

$$RAdjZ_{x,t} = (R_{x,t} - S_{x,0}) \cdot I_t + S_{x,t}$$

$RAdjZ_{x,t}$ is the mortality- and gross migration-adjusted cohort change ratio for age-by-sex x, time t
$R_{x,t}$ is the unadjusted cohort change ratio for age-by-sex x, at time t
$S_{x,0}$ is the imputed survivorship factor for age-by-sex x, at time 0
$S_{x,t}$ is the imputed survivorship factor for age-by-sex x, at time t
I_t is the gross migration adjustment factor (centered on 1), at time t

Combined mortality and gross migration adjustment.

-More info/thoughts at:
https://github.com/edyhsgr/CCRStable/blob/master/Oct2020Presentation/EddieH_FSU_Oct2020.pdf

$$N_{x,t} = Adj_t \cdot K_t \cdot G_{x,t}$$

$N_{x,t}$ is the net migration adjustment for age-by-sex x, at time t
Adj_t is the adjustment factor, a proportion of total population, at time t
K_t is the total population at time t
$G_{x,t}$ is from a proportional (sum of 1) migration profile, which may be generic

Net migration adjustment – for a vector to be added to projected population by time step, to manage the level of net migration.

-Slides with background thoughts on adjusting net migration: https://edyhsgr.github.io/documents/ProjPresentation.pdf
-Migration by age over time comparisons from Alaska data: https://shiny.demog.berkeley.edu/eddieh/AKPFDMigrationReview/
-Interface with net migration adjustment examples and comparisons: https://shiny.demog.berkeley.edu/eddieh/NMAdjustCompare/
-More info/thoughts at: https://github.com/edyhsgr/CCRStable/blob/master/Oct2020Presentation/EddieH_FSU_Oct2020.pdf