SUPPLEMENTAL INFORMATION

If $Y \sim ZINB(\omega, \mu)$, then $E(Y) = (1-\omega)\mu$. Define $f(\omega, \mu) = (1-\omega)\mu$. Then, applying the delta method (Cooch and White 2006), we obtain

$$\begin{aligned} \widehat{E(Y)} &= E(f(\hat{\omega}, \hat{\mu})) \\ &\approx f[E(\hat{\omega}), E(\hat{\mu})] \\ &= (1 - E(\hat{\omega}))E(\hat{\mu}) \end{aligned}$$

and

$$\begin{aligned} Var\left[\widehat{E(Y)}\right] &= Var(f(\hat{\omega}, \hat{\mu})) \\ &\approx \left[\frac{\partial f}{\partial \underline{\theta}}\right]^T \cdot \hat{\Sigma} \cdot \left[\frac{\partial f}{\partial \underline{\theta}}\right]_{\hat{\underline{\theta}}}, \end{aligned}$$

where

$$\underline{\theta} = \left[\underline{\omega}^T, \underline{\mu}^T\right]^T \quad \text{and} \quad \hat{\Sigma} = cov\left(\hat{\underline{\theta}}\right).$$

In the regression model,

$$\mu_i = \exp(\gamma_0 + \gamma_1 z_{i1} + \gamma_2 z_{i2} + \cdots + \gamma_q z_{iq}) \equiv g_{1i}\left(\underline{\gamma} | \underline{z_i}\right) \tag{S1}$$

and

$$\omega_i = P_i = \frac{\exp(\beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \cdots + \beta_p x_{ip})}{1 + \exp(\beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \cdots + \beta_p x_{ip})} \equiv g_{2i}\left(\underline{\beta} | \underline{x_i}\right), \tag{S2}$$

where $\gamma_0, \gamma_1, \gamma_2, \ldots, \gamma_q$, and $\beta_0, \beta_1, \beta_2, \ldots, \beta_p$, are unknown coefficients of the count and "zero-inflated" components of the model, respectively, and $z_1, z_2, \ldots z_{iq}$ and $x_1, x_2, \ldots x_{ip}$ are known covariates of the count and "zero-inflated" components of the model, respectively. Thus, the estimated expected counts and standard errors of the expected counts are, respectively,

$$\begin{aligned} \widehat{E(Y)} &= E\left[f\left(g_2\left(\hat{\beta}\right), g_1(\hat{\gamma})\right)\right] \\ &\approx f\left[g_2\left(E\left(\hat{\beta}\right)\right), g_1\left(E\left(\hat{\gamma}\right)\right)\right] \end{aligned} \tag{S3}$$

and

$$\begin{aligned} Var\left[\widehat{E(Y)}\right] &= Var\left[f\left(g_2\left(\hat{\beta}\right), g_1(\hat{\gamma})\right)\right] \\ &\approx \left[\frac{\partial(f \circ g)}{\partial \underline{\xi}}\right]^T \cdot \hat{\Gamma} \cdot \left[\frac{\partial(f \circ g)}{\partial \underline{\xi}}\right]_{\hat{\underline{\xi}}}, \end{aligned} \tag{S4}$$

where

$$\underline{\xi} = \left[\underline{\gamma}^T, \underline{\beta}^T\right]^T \quad \text{and} \quad \hat{\Gamma} = cov\left(\hat{\underline{\xi}}\right).$$