Require: Samples from the previous iteration $(\mathcal{T}_t, \mathcal{T}_t^1, \mathcal{T}_t^0, \mathcal{M}_t, \mathcal{M}_t^1, \mathcal{M}_t^0)$ for $t = 1, \dots, T$ and $(\sigma_1^2, \sigma_0^2, \boldsymbol{s}_{12})$, and data $(y_i, A_i, \boldsymbol{X}_i)$ for $i = 1, \cdots, N$

for $r = 1, \dots, M$ iteration **do**

  for $i = 1, \dots, N$ **do**

    $$Z_i \sim \begin{cases} N\left(\sum_{t=1}^{T} g_1(\boldsymbol{X}_i; \mathcal{T}_t, \mathcal{M}_t), 1\right) I_{(Z_i > 0)} & \text{for } A_i = 1; \\ N\left(\sum_{t=1}^{T} g_1(\boldsymbol{X}_i; \mathcal{T}_t, \mathcal{M}_t), 1\right) I_{(Z_i \le 0)} & \text{for } A_i = 0 \end{cases}$$ ▷ latent exposure variable

  end for

  for $j = 1, \dots, T$ **do**

    for $i = 1, \dots, N$ **do**

      $R_{i,-j}^{(r)} = Z_i - \sum_{t \neq j} g_1(\boldsymbol{X}_i; \mathcal{T}_t, \mathcal{M}_t)$ ▷ residual of the exposure model

      $H_{i,-j}^{1,(r)} = y_i - \sum_{t \neq j} g_2^1(\boldsymbol{X}_i; \mathcal{T}_t^1, \mathcal{M}_t^1)$ ▷ residual of the outcome model for $i \in \mathcal{I}_1$

      $H_{i,-j}^{0,(r)} = y_i - \sum_{t \neq j} g_2^0(\boldsymbol{X}_i; \mathcal{T}_t^0, \mathcal{M}_t^0)$ ▷ residual of the outcome model for $i \in \mathcal{I}_0$

    end for

    $\mathcal{T}_j^{(r)} \sim [\mathcal{T}_j | R_{1,-j}^{(r)}, \cdots, R_{N,-j}^{(r)}, 1]$ ▷ based on one of the three acceptance ratios

    $\mathcal{T}_j^{1,(r)} \sim [\mathcal{T}_j^1 | \boldsymbol{H}_{\cdot,-j}^{1,(r)}, \sigma_1^2]$ ▷ based on one of the three acceptance ratios

    $\mathcal{T}_j^{0,(r)} \sim [\mathcal{T}_j^0 | \boldsymbol{H}_{\cdot,-j}^{0,(r)}, \sigma_0^2]$ ▷ based on one of the three acceptance ratios

    $\mathcal{M}_j^{(r)} \sim [\mathcal{M}_j | \mathcal{T}_j^{(r)}, R_{1,-j}^{(r)}, \cdots, R_{N,-j}^{(r)}, 1]$

    $\mathcal{M}_j^{1,(r)} \sim [\mathcal{M}_j^1 | \mathcal{T}_j^{1,(r)}, \boldsymbol{H}_{\cdot,-j}^{1,(r)}, \sigma_1^2]$

    $\mathcal{M}_j^{0,(r)} \sim [\mathcal{M}_j^0 | \mathcal{T}_j^{0,(r)}, \boldsymbol{H}_{\cdot,-j}^{0,(r)}, \sigma_0^2]$ where, for each $a \in \{0, 1\}$, $\boldsymbol{H}_{\cdot,-j}^{a,(r)}$ denotes $\{H_{i,-j}^{a,(r)} | i \in \mathcal{I}_a\}$

  end for

$$\sigma_1^2 \sim \text{Inv.Gamma}\left(a_\sigma + \frac{|\mathcal{I}_1|}{2}, b_\sigma + \frac{1}{2}\left\{\sum_{i \in \mathcal{I}_1}\left(y_i - \sum_{t=1}^{T} g_2^1(\boldsymbol{X}_i; \mathcal{T}_t^1, \mathcal{M}_t^1)\right)\right\}\right)$$

$$\sigma_0^2 \sim \text{Inv.Gamma}\left(a_\sigma + \frac{|\mathcal{I}_0|}{2}, b_\sigma + \frac{1}{2}\left\{\sum_{i \in \mathcal{I}_0}\left(y_i - \sum_{t=1}^{T} g_2^0(\boldsymbol{X}_i; \mathcal{T}_t^0, \mathcal{M}_t^0)\right)\right\}\right)$$

  Update $\boldsymbol{s}_{12}^{(r)}$ via the Gibbs algorithm:

$$\boldsymbol{s}_{12}^{(r)} \sim \mathcal{D}\left(n_{1,1} + n_{1,21} + n_{1,20} + \alpha/P, \cdots, n_{P,1} + n_{P,21} + n_{p,20} + \alpha/P\right)$$

end for