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Correction to: Studies on the basic reproduction number in stochastic epidemic models with random perturbations

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The original article can be found online at https://doi.org/10.1186/s13662-021-03445-2

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1 Correction

Following publication of the original article [1], some errors in the equations were found in the article due to the typesetting mistakes:

On page 7,

$$\mathcal{L}\big(W(t)\big) = f^T \frac{\partial V}{\partial x} + \frac{406}{2} g^T \frac{\partial V}{\partial x} g \leq \lambda_1 a(t) + \lambda_2 b(t) + \lambda_3 c(t)$$

should be

$$\mathcal{L}\big(W(t)\big) = f^T \frac{\partial V}{\partial x} + \frac{1}{2} g^T \frac{\partial V}{\partial x} g \leq \lambda_1 a(t) + \lambda_2 b(t) + \lambda_3 c(t).$$

On page 12,

$$\lim_{l \to +\infty} B(l) e^{-(\mu+\gamma)l} = B(0) - (\mu+\gamma) \int_0^{+\infty} B(a) e^{-(\mu+\gamma)a}\, da + \int_0^{+\infty} e^{-(\mu+\gamma)a}\, dB(a)$$

should be

$$\lim_{l \to +\infty} B(l) e^{-(\mu+\gamma)l} = B(0) - (\mu+\gamma) \int_0^{+\infty} B(a) e^{-(\mu+\gamma)a}\, da + \int_0^{+\infty} e^{-(\mu+\gamma)a}\, dB(a).$$

On page 15,

$$\frac{\sigma Z_{\alpha/2} + \bar{R}\sqrt{2n}\beta\sqrt{(\mu+\upsilon)(\mu+\gamma)}}{\bar{R}\sqrt{2n}\beta\sqrt{(\mu+\upsilon)(\mu+\gamma)}} < \frac{945}{R_0^{\mathrm{SIR}}} < \frac{\sigma Z_{1-\alpha/2} + \bar{R}\sqrt{2n}\beta\sqrt{(\mu+\upsilon)(\mu+\gamma)}}{\bar{R}\sqrt{2n}\beta\sqrt{(\mu+\upsilon)(\mu+\gamma)}}$$

should be

$$\frac{\sigma Z_{\alpha/2} + \bar{R}\sqrt{2n}\beta\sqrt{(\mu+\upsilon)(\mu+\gamma)}}{\bar{R}\sqrt{2n}\beta\sqrt{(\mu+\upsilon)(\mu+\gamma)}} < \frac{1}{R_0^{\mathrm{SIR}}} < \frac{\sigma Z_{1-\alpha/2} + \bar{R}\sqrt{2n}\beta\sqrt{(\mu+\upsilon)(\mu+\gamma)}}{\bar{R}\sqrt{2n}\beta\sqrt{(\mu+\upsilon)(\mu+\gamma)}}.$$

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On page 18,

$$\frac{}{(\mu+\upsilon)(\mu+\gamma)}\left(\frac{\eta N}{2\mu}+\frac{1}{\sigma g}\right)\leq E\big(R_{0,\nu}^{\mathrm{SEIRS}}\big)\leq\frac{}{(\mu+\upsilon)(\mu+\gamma)}\left(\frac{\eta N}{2\mu}+\frac{1}{\sigma l}\right)\tag{4.4}$$

should be

$$\frac{\upsilon\beta}{(\mu+\upsilon)(\mu+\gamma)}\left(\frac{\eta N}{2\mu}+\frac{1}{\sigma g}\right)\leq E\big(R_{0,\nu}^{\mathrm{SEIRS}}\big)\leq\frac{\upsilon\beta}{(\mu+\upsilon)(\mu+\gamma)}\left(\frac{\eta N}{2\mu}+\frac{1}{\sigma l}\right).\tag{4.4}$$

On page 21,

$$\frac{\partial W}{\partial I(t)}=\lambda_2\big(\upsilon E+(\mu+\upsilon)I\big)y\frac{\partial W}{\partial R(t)}=\lambda_4 R$$

should be

$$\frac{\partial W}{\partial I(t)}=\lambda_2\big(\upsilon E+(\mu+\upsilon)I\big),\qquad\frac{\partial W}{\partial R(t)}=\lambda_4 R.$$

On page 23,

$$V\big(S(t),I(t),R(t)\big):=\lambda_1\left(\frac{\eta}{\mu}N-S(t)\right)^2+\lambda_2\frac{1}{2}I^2(t)+\lambda_3\frac{1428}{2}R^2(t)$$

should be

$$V\big(S(t),I(t),R(t)\big):=\lambda_1\left(\frac{\eta}{\mu}N-S(t)\right)^2+\lambda_2\frac{1}{2}I^2(t)+\lambda_3\frac{1}{2}R^2(t).$$

The publisher apologizes for the errors caused. The original paper has been updated.

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References

1. Ríos-Gutiérrez, A., et al.: Studies on the basic reproduction number in stochastic epidemic models with random perturbations. Adv. Differ. Equ. **2021**, 288 (2021). https://doi.org/10.1186/s13662-021-03445-2