Published online: 26 April 2023

,

,

, ρ ,

ρ

ρ

$\geq$

$\geq$

$$, \quad \begin{cases} \rho \quad - \quad - , \quad \int \quad , \quad - \quad - , \quad \geq \\ \int \quad , \quad -^{a} , \quad - \end{cases}$$

ρ

, $-$

λ^- ,

$$, \quad \begin{cases} \frac{- \; a -}{-}\left[- \quad \lambda \quad \lambda \quad - \right] \quad \geq \\ \frac{}{-}\left[- \quad \lambda \quad - \right] \end{cases}$$

$-$

λ^-

λ^-

λ^-

$— \quad —]$, , , , ,

Δ

λ

$\frac{}{- \; -} \quad \frac{}{\lambda \; \lambda},$

$, \quad , \quad , \quad {}_{a}- \; , \quad , \quad , \lambda$

$, \quad \infty$

$, \quad ,$

$\sim \mathcal{N} \; \hat{} \; ,$

$\leq \quad \leq \quad \hat{}$

$\equiv$

$\lambda \qquad \Delta \quad \leq \quad \leq$

$-$

$-$

$-$

$, \quad \sim \mathcal{N} \; ,$

$, \quad \sim \mathcal{N} \; , \quad ,$

$- \quad \Delta \quad , \quad \epsilon \; ,$

$\mathcal{N} \; , \qquad \epsilon \; \sim \mathcal{N} \; ,$

$\mathcal{N} \; ,$ ﬃ

$.$

$.$

$-$

$\hat{} -$

$, \quad \equiv \quad \Delta \; , \quad \leq \quad \leq$

$-$

$\Delta \; ,$

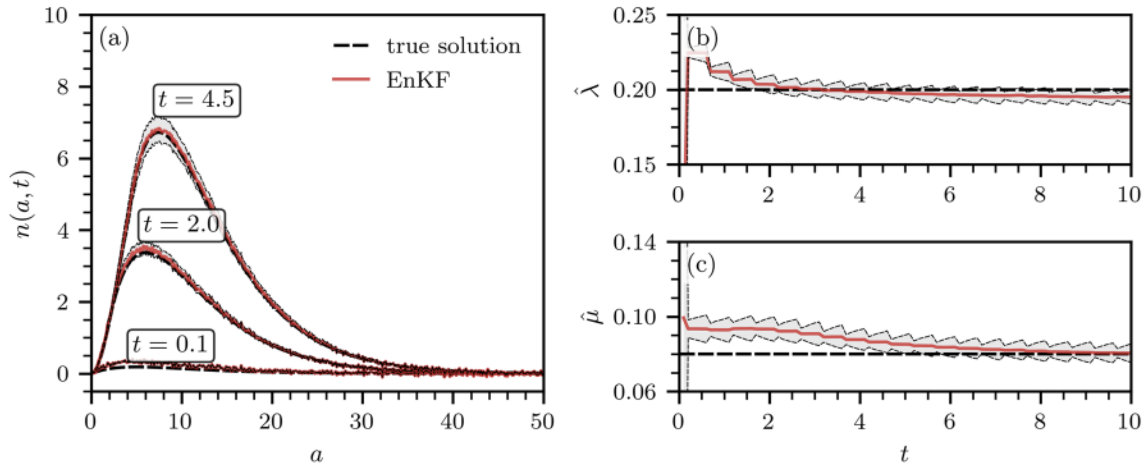
Δ

$, \quad , \quad , \quad ,$

$\hat{} - \qquad -\sum \quad -$

Δ

$- \qquad \frac{}{} \quad [\; - \quad - \;][\; - \quad - \;]$



(a)
true solution
EnKF
$t = 4.5$
$t = 2.0$
$t = 0.1$
$n(a,t)$
a
(b)
$\hat{\lambda}$
(c)
$\hat{\mu}$
t

Δ Δ

$-$ $_a$ $-$, , $-$

$\hat{}$ $-$, , $-$, $-$, $-$

, , , ,

λ

$-$

λ

, λ

σ

λ

,

, , ,

$-$ $-]$, , ,

, , ,

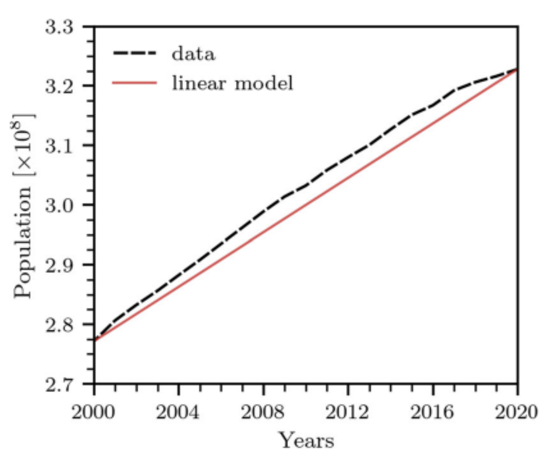
$-$ $-]$, , , ,

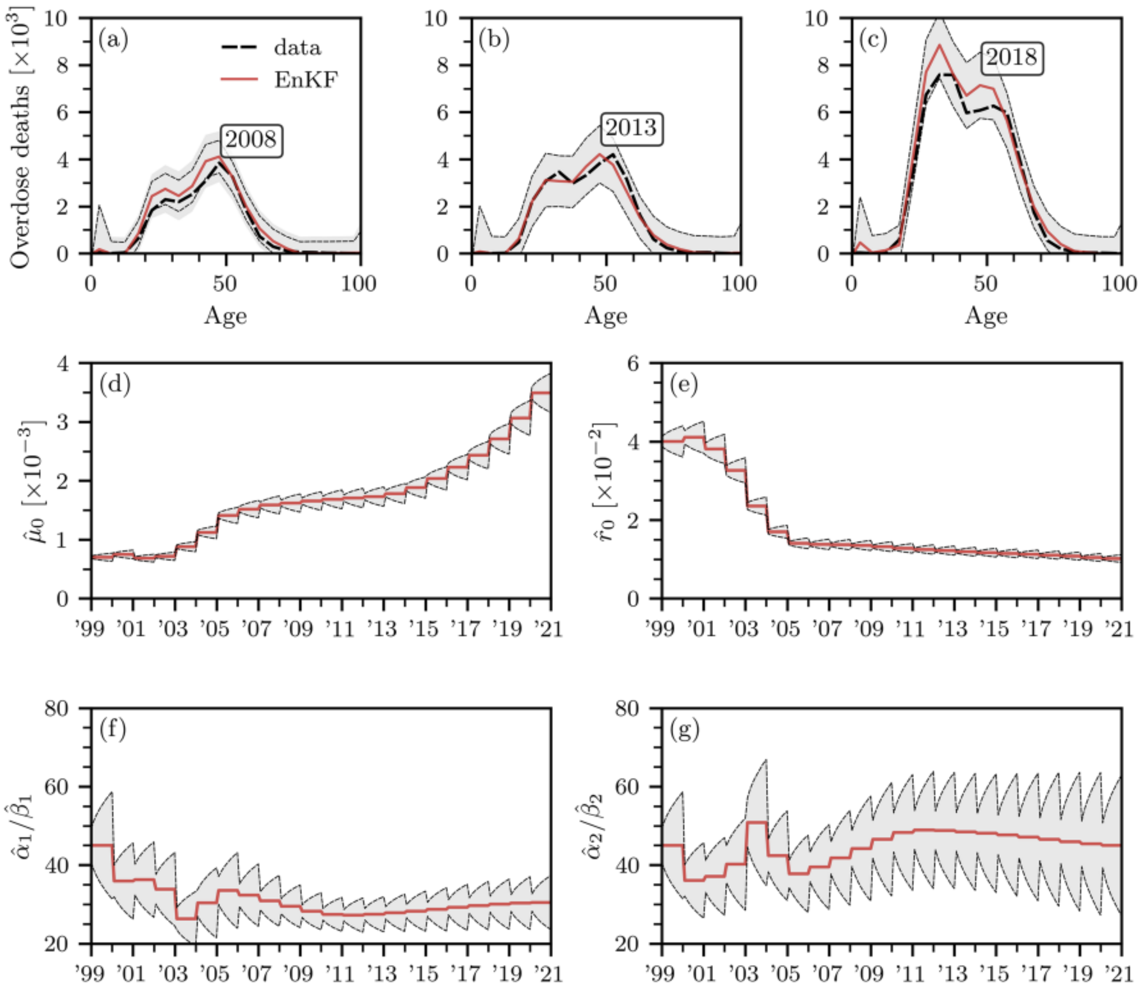
, ,

, , , , , ,

, , , , ,

Δ ,





$\hat{\alpha}$ $\hat{\beta}$, $\hat{\alpha}$ $\hat{\beta}$ σ

Δ

α , β , α , β

,

α , β

α , β

, $\int$, $'$, $'$ $'$ $\leq$ $\leq$,

, $\equiv$ — α , β α , β ,

,

,

, , α , β , α , β

$-$ $-$

, , , $_a-$, , ffi

, , , $_a-$, , , , α , β , α , β]

,

ffi

Δ

Δ' , Δ' , Δ' , , Δ' , Δ'

,

, $'_{\ell-}$, $'_{\ell}$ $\leq \ell \leq$ σ

$'_{\ell}$,

$'_{\ell}$ $'$ $\sum^{\ell}$ Δ

$\ell \geq$, ^ ^

$'_{\ell}$,

$'$, , $'$, ,

,

, α β α

β $-$

α β α β

α β α β

$-$

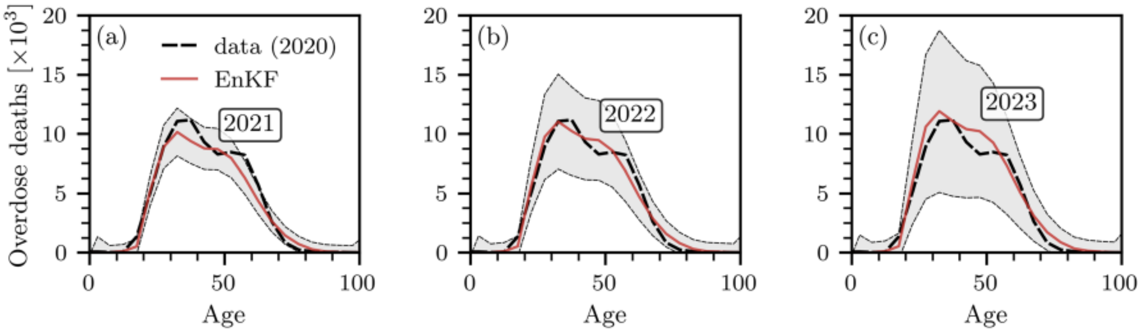
α β

α β $-$

,

,

,



σ

$'$

,

, $\equiv$ α , β α , β

Δ ,

ρ' ρ

$\int$ $(\quad ' \quad)$

$\int \Delta$

$\int \quad ' \quad ' \int$

$\int \quad ' \quad '$

$$\int \frac{\beta^{\alpha}}{\Gamma\,\alpha} \quad '\,\alpha - \quad -\beta \quad - \quad ' \quad \frac{}{\Gamma\,\alpha}\,\Gamma\,\alpha, \quad \beta \quad \Gamma\,\alpha,\ \beta\ ,$$

Γ , $\int^{\infty}$

$\int$.

ρ α, β ,

α, β

α β

α β