



Universidade Federal do Ceará

## Modelagem epidemiológica do COVID19 para o Estado do Ceará empregando o modelo SEIIR

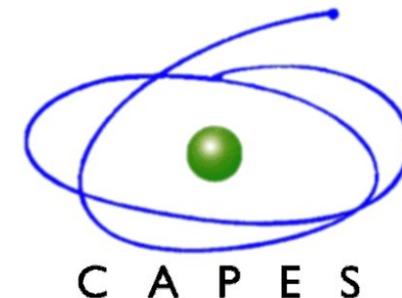
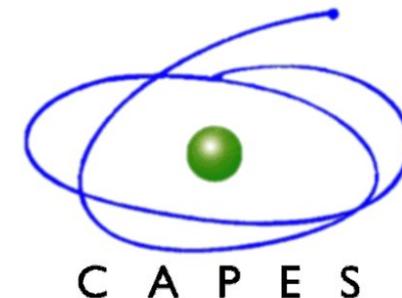
**Equipe Cientista-Chefe de Dados (UFC & CAPP-IPECE):**

**José Soares de Andrade (UFC-Física)**

**Humberto Carmona (UFC-Física)**

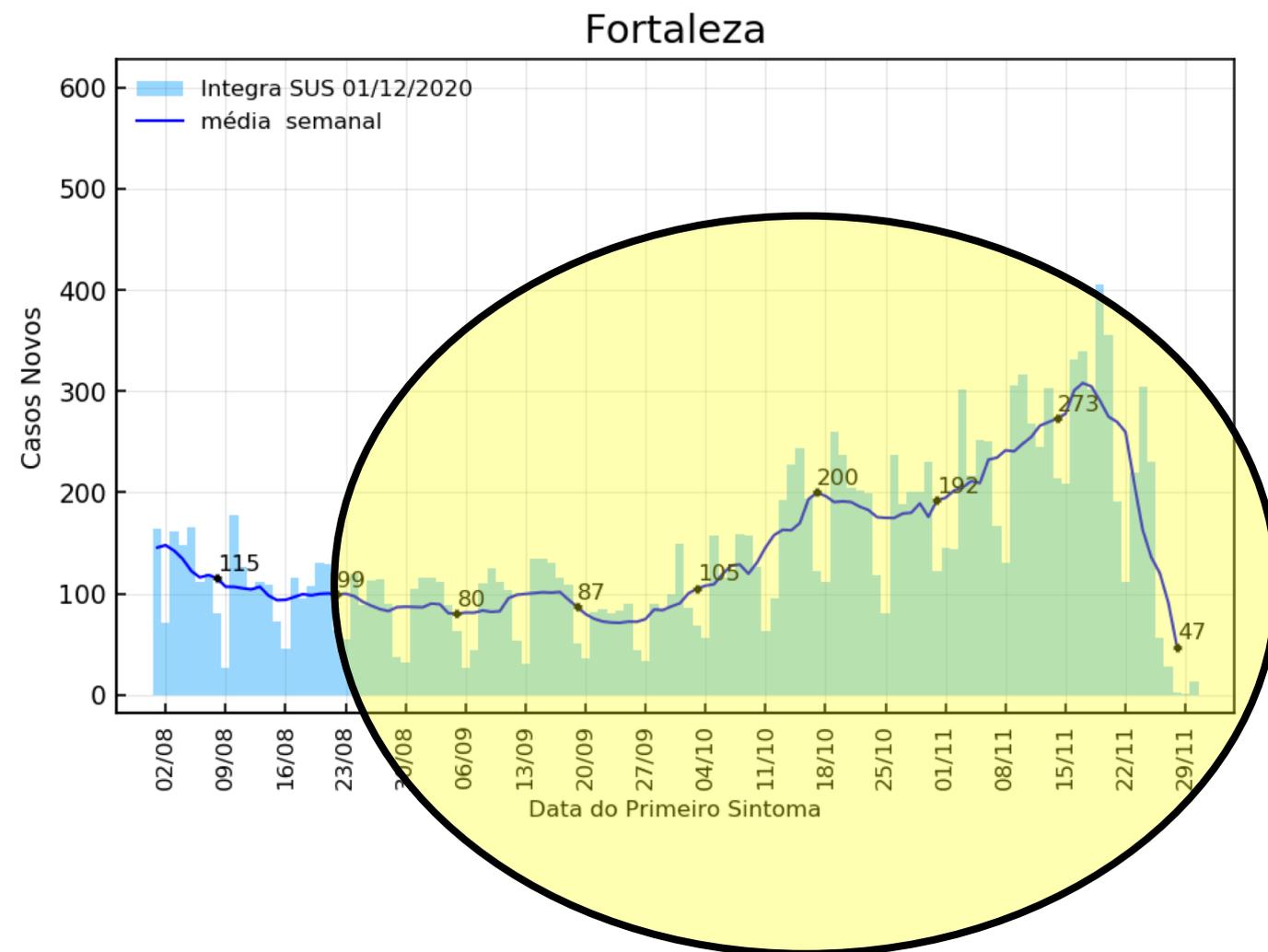
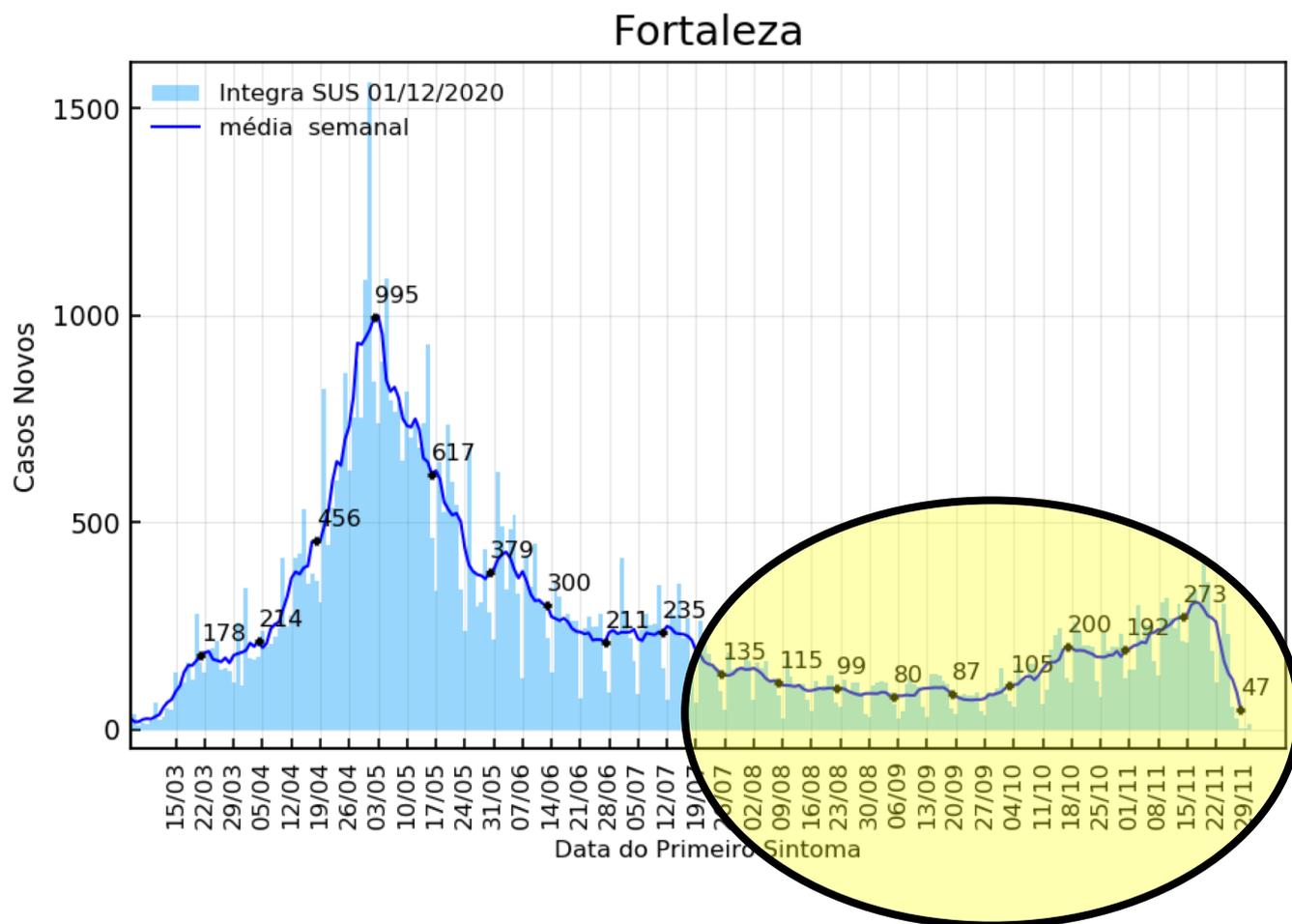
**Rilder Pires (CAPP-IPECE-SEPLAG)**

**Saulo Reis (UFC-Física)**



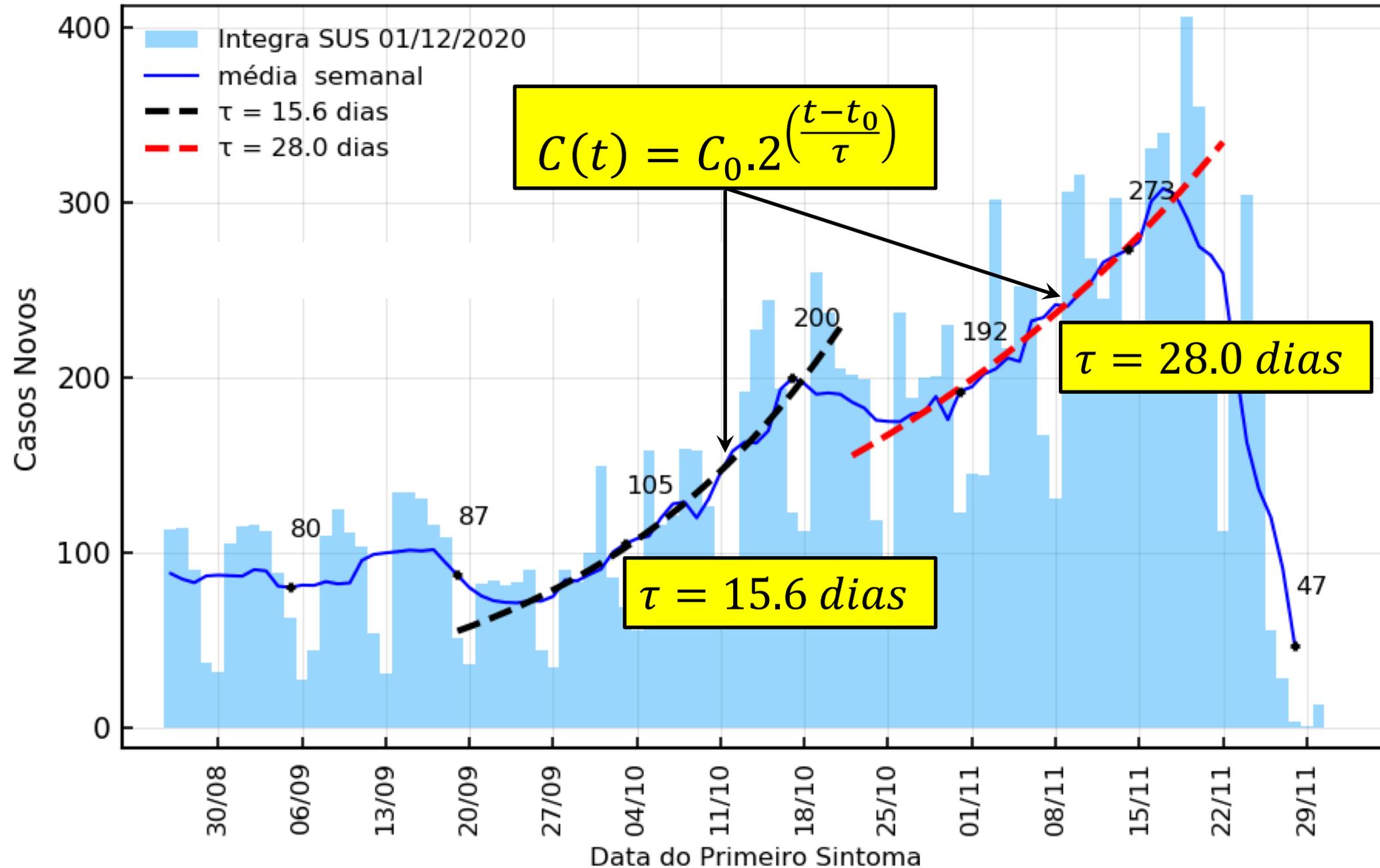
**Fortaleza (capital)**

# Dados atualizados em 02/12/2020

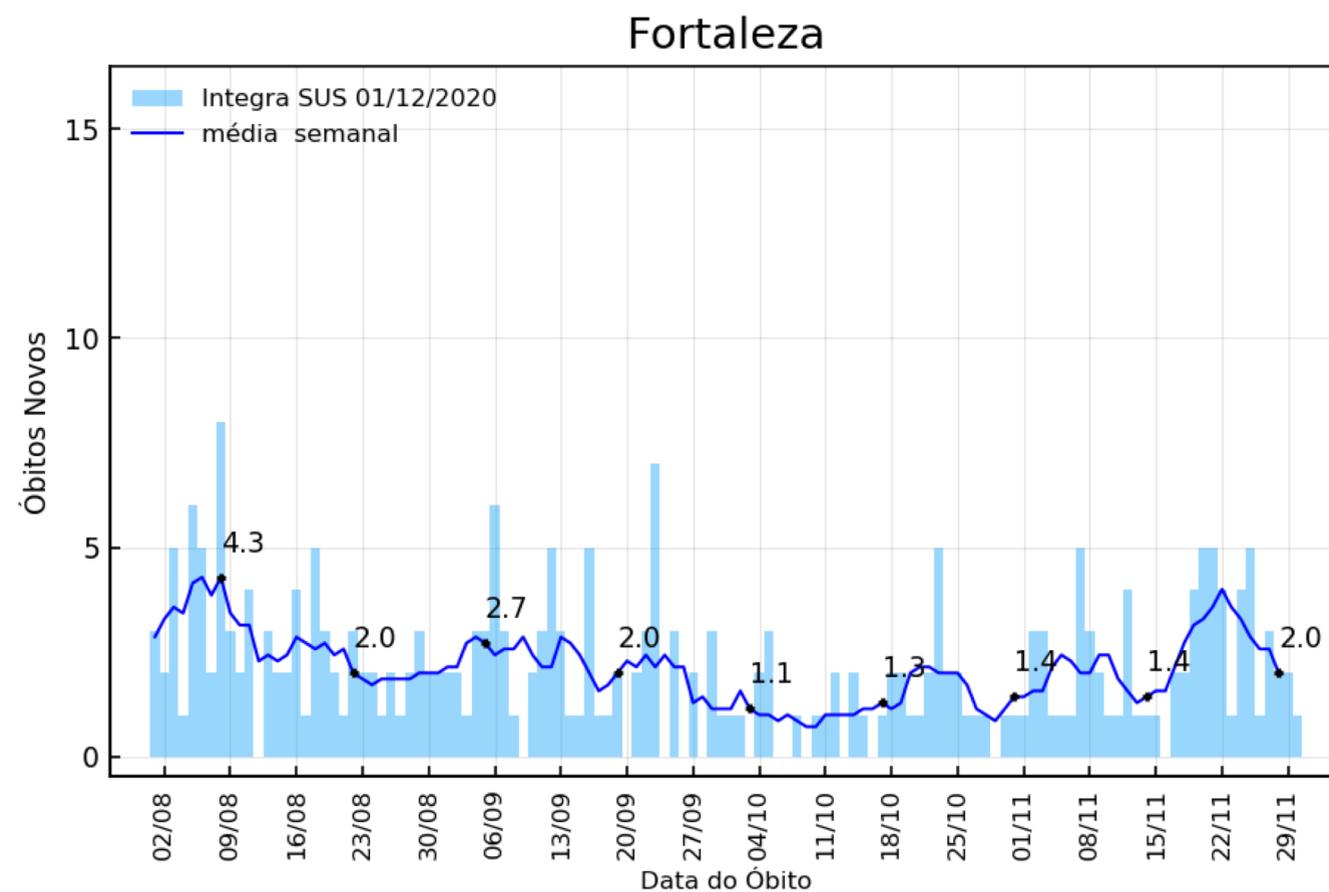
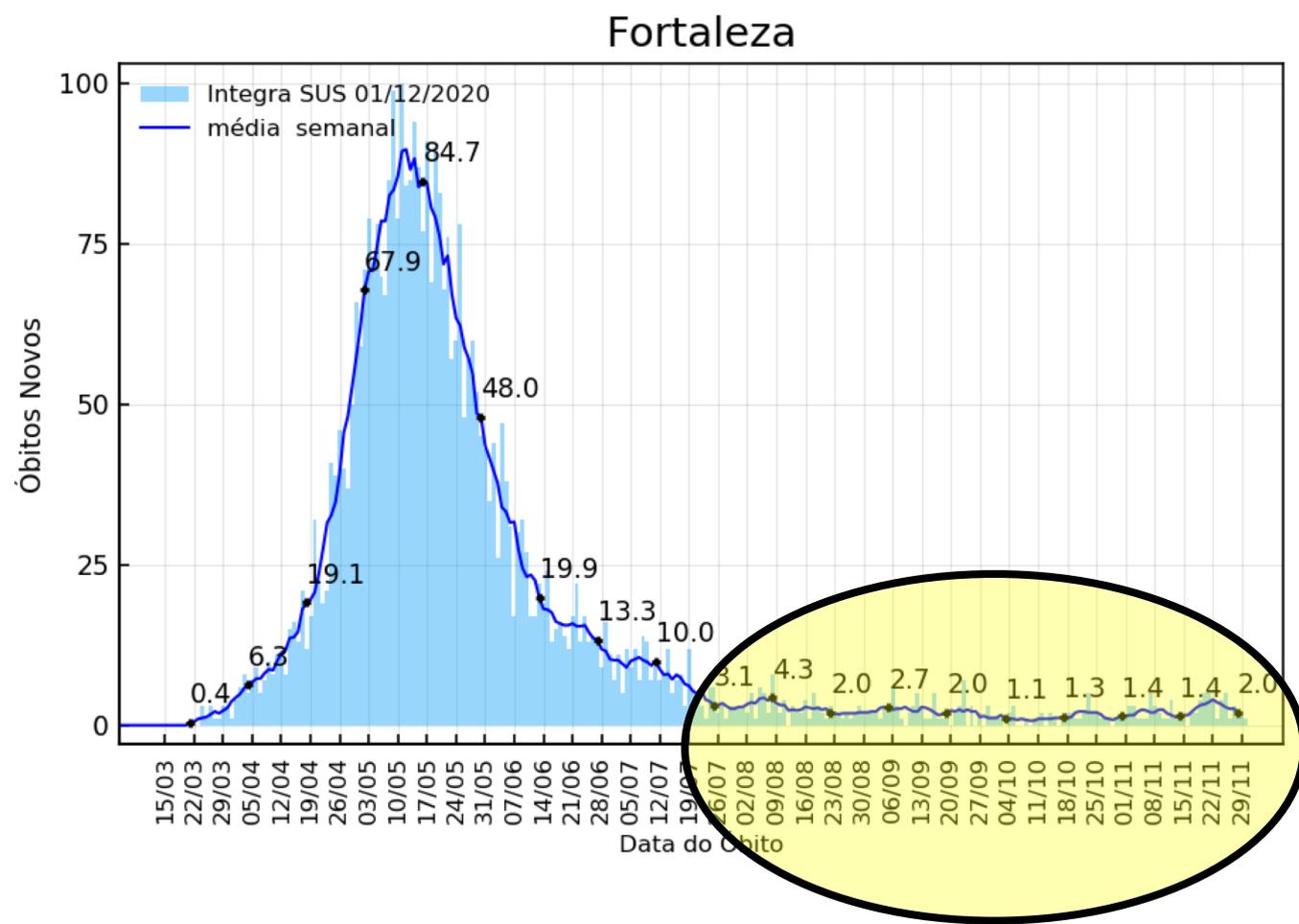


# Tempo Característico de Duplicação de Casos ( $\tau$ )

Fortaleza



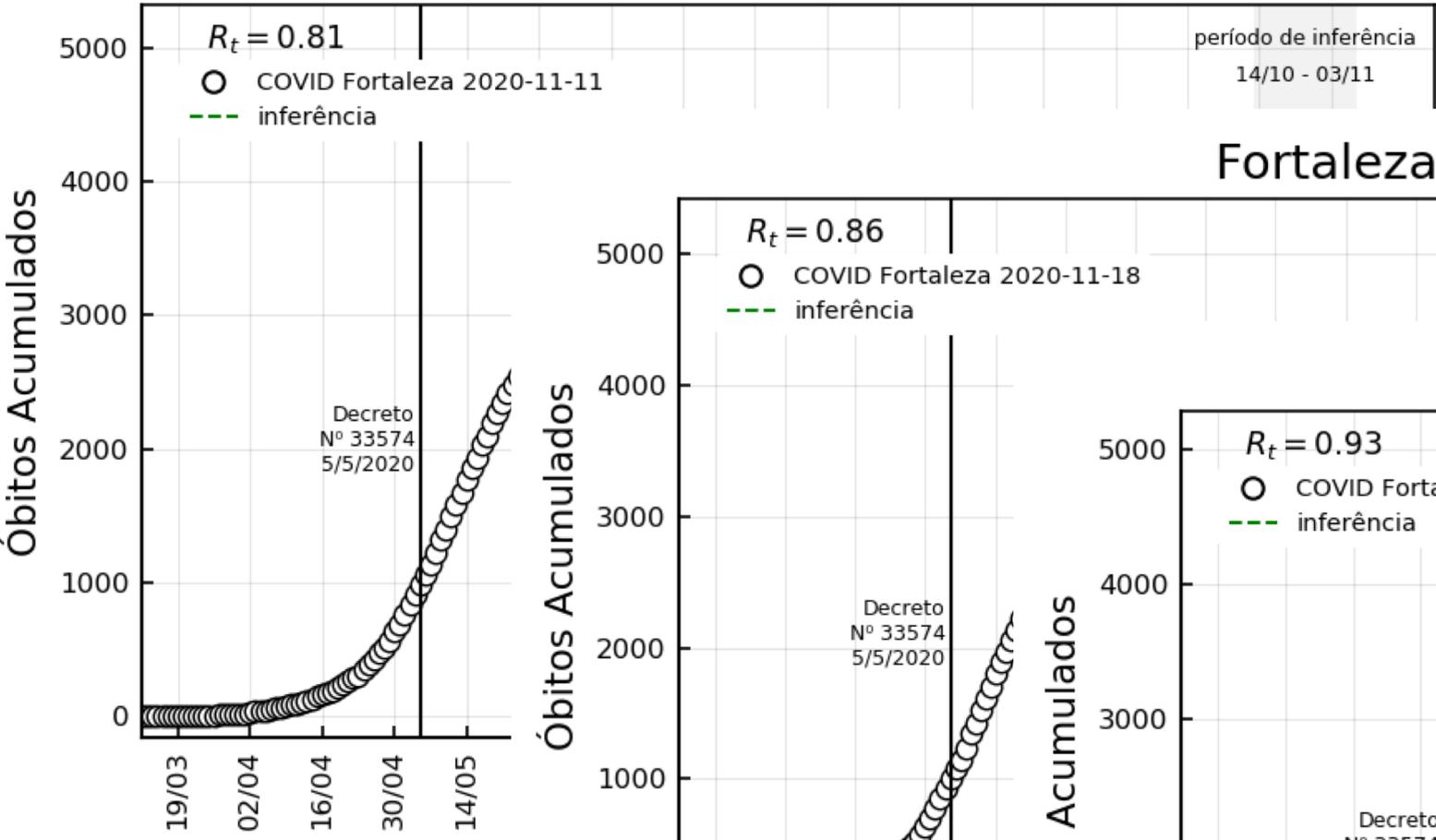
# Dados atualizados em 02/12/2020



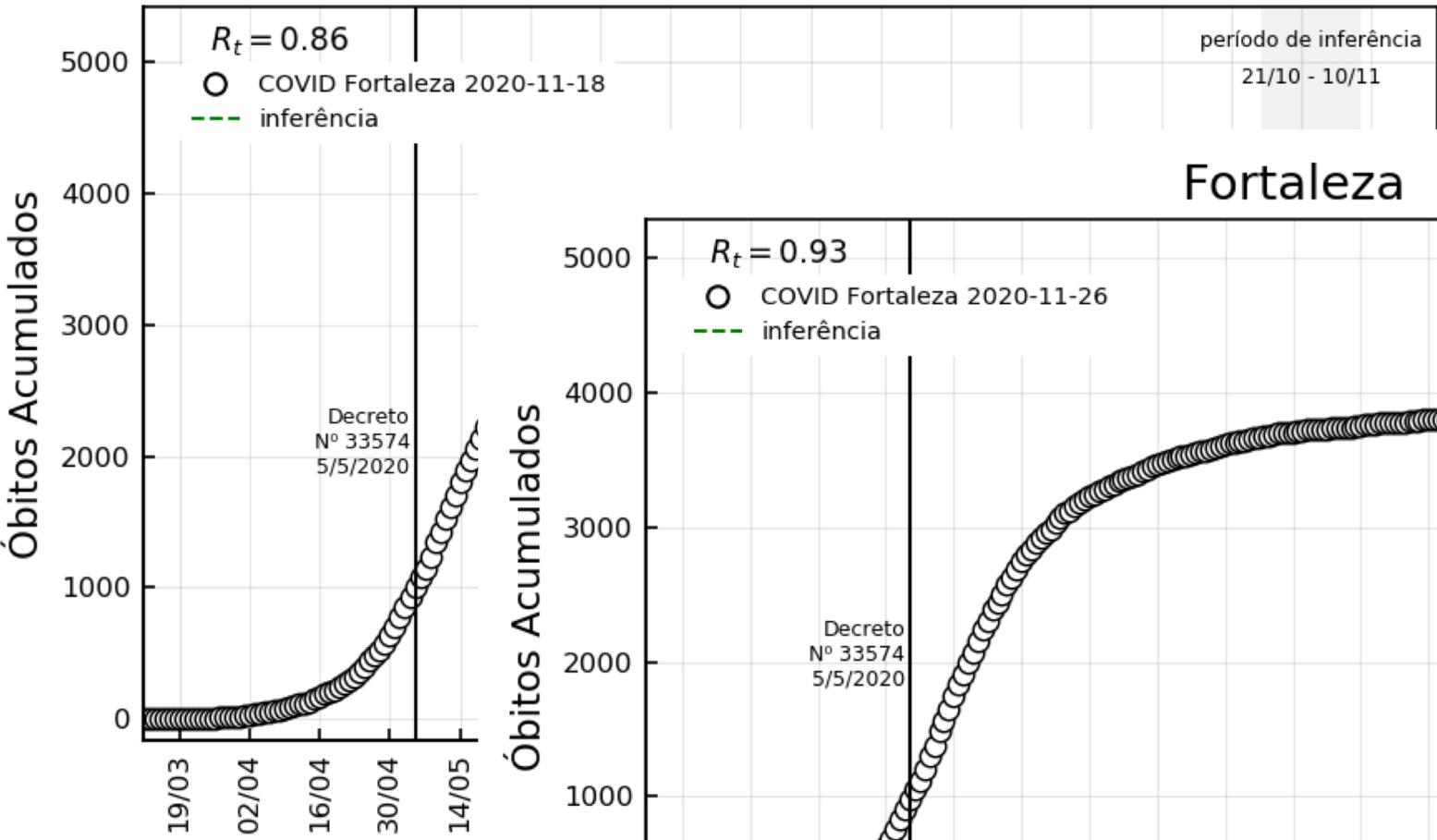
# Inferência com Óbitos

## 26/11/2020

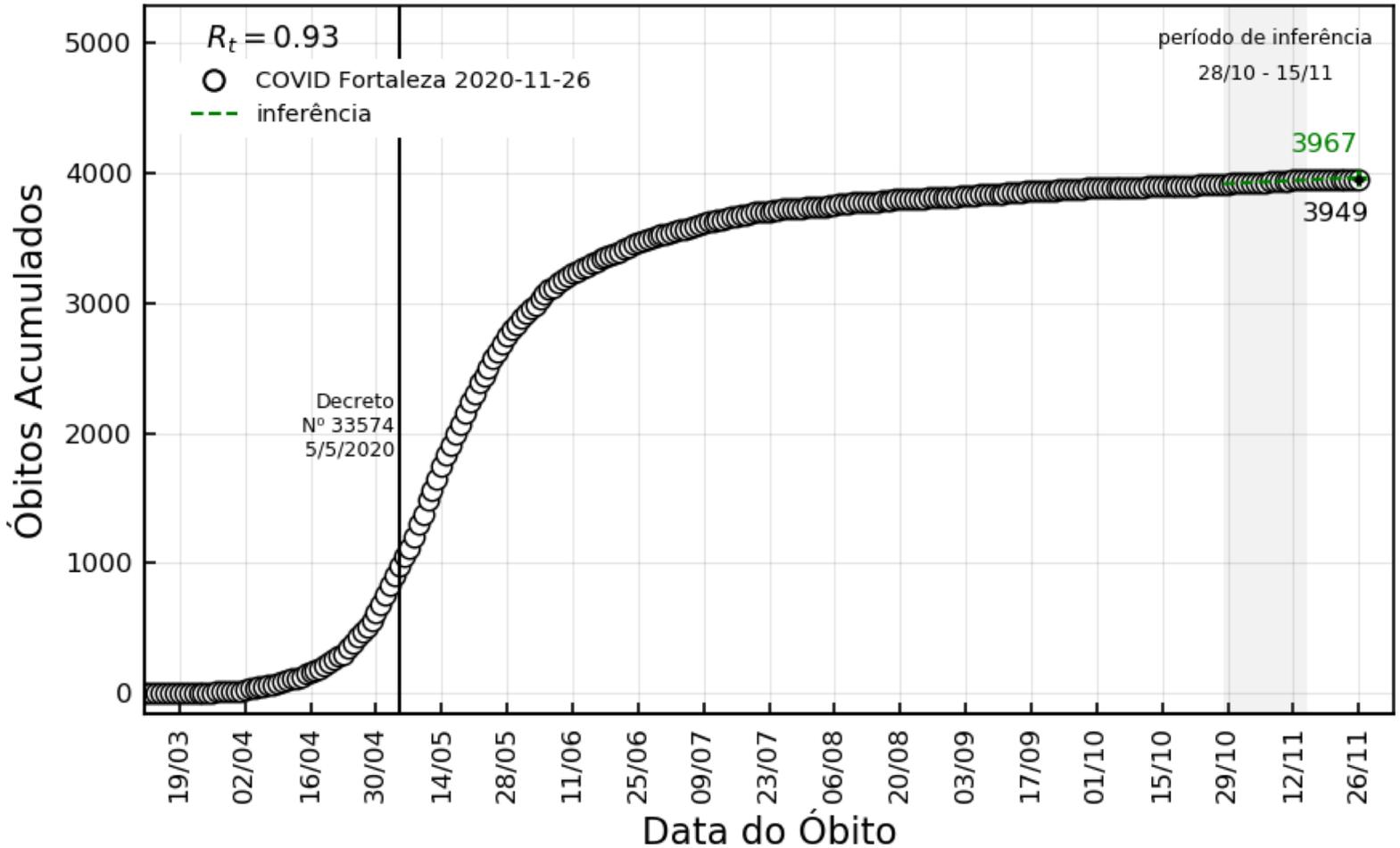
### Fortaleza



### Fortaleza

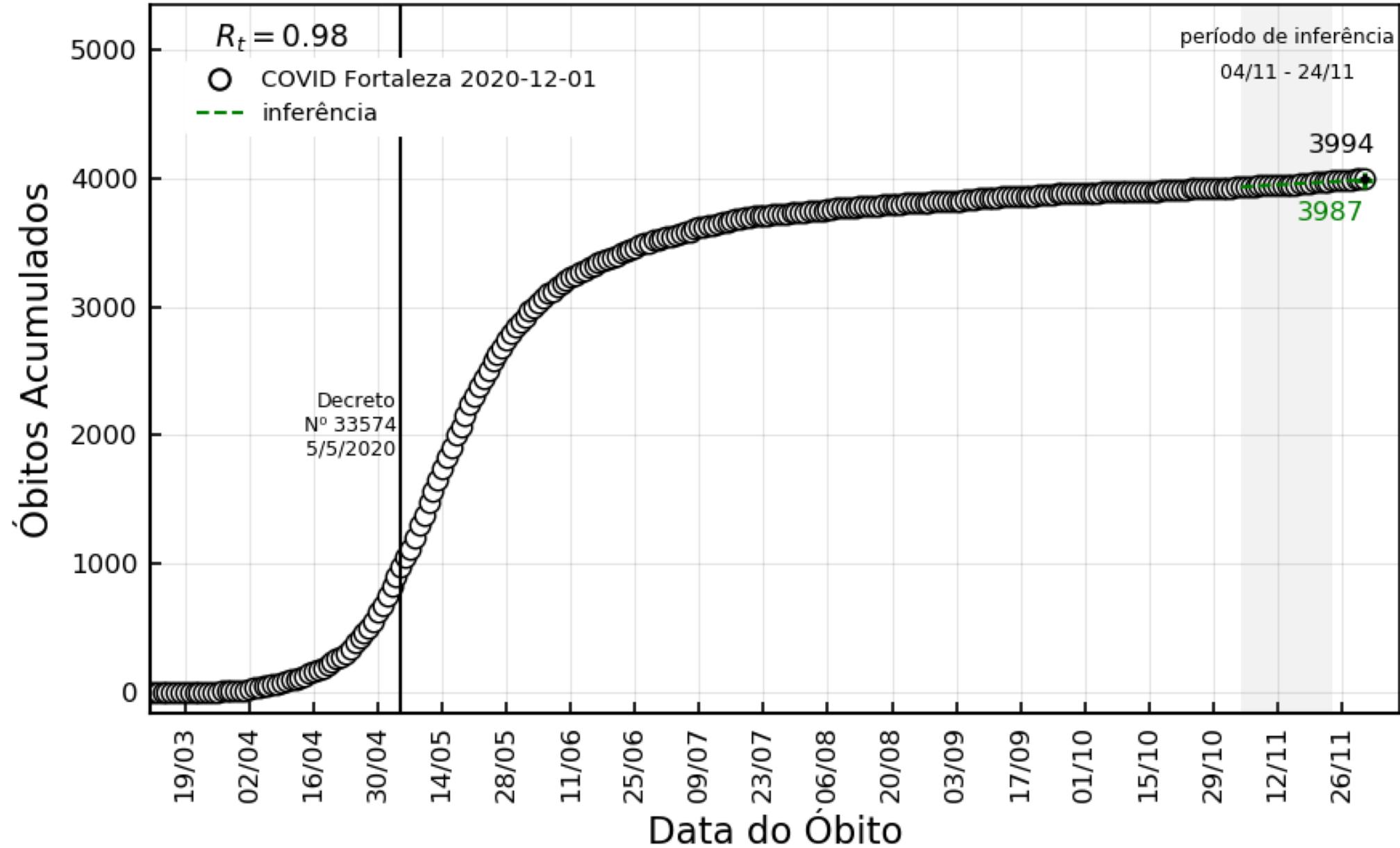


### Fortaleza



# Inferência com Óbitos 02/12/2020

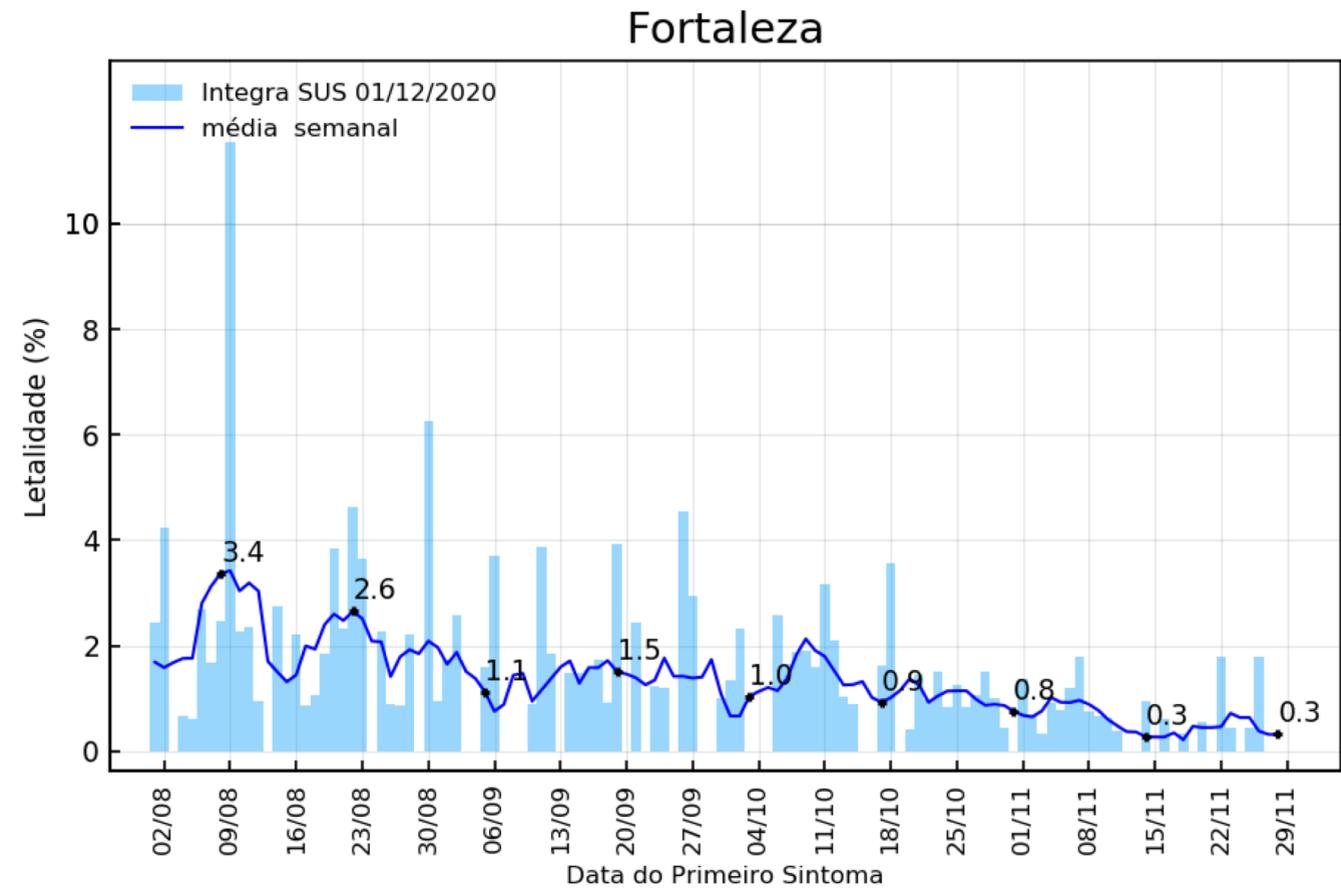
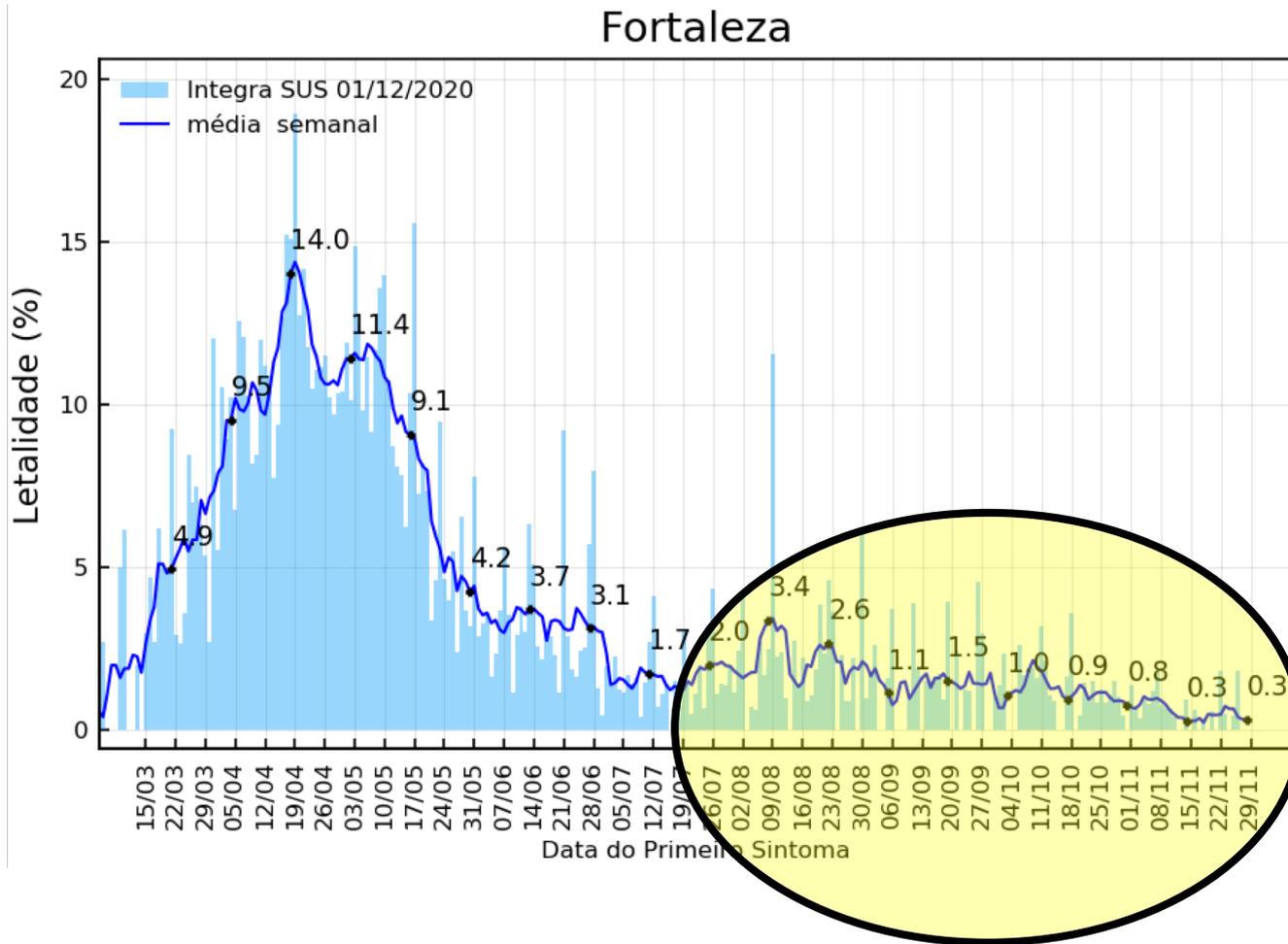
## Fortaleza



# Letalidade

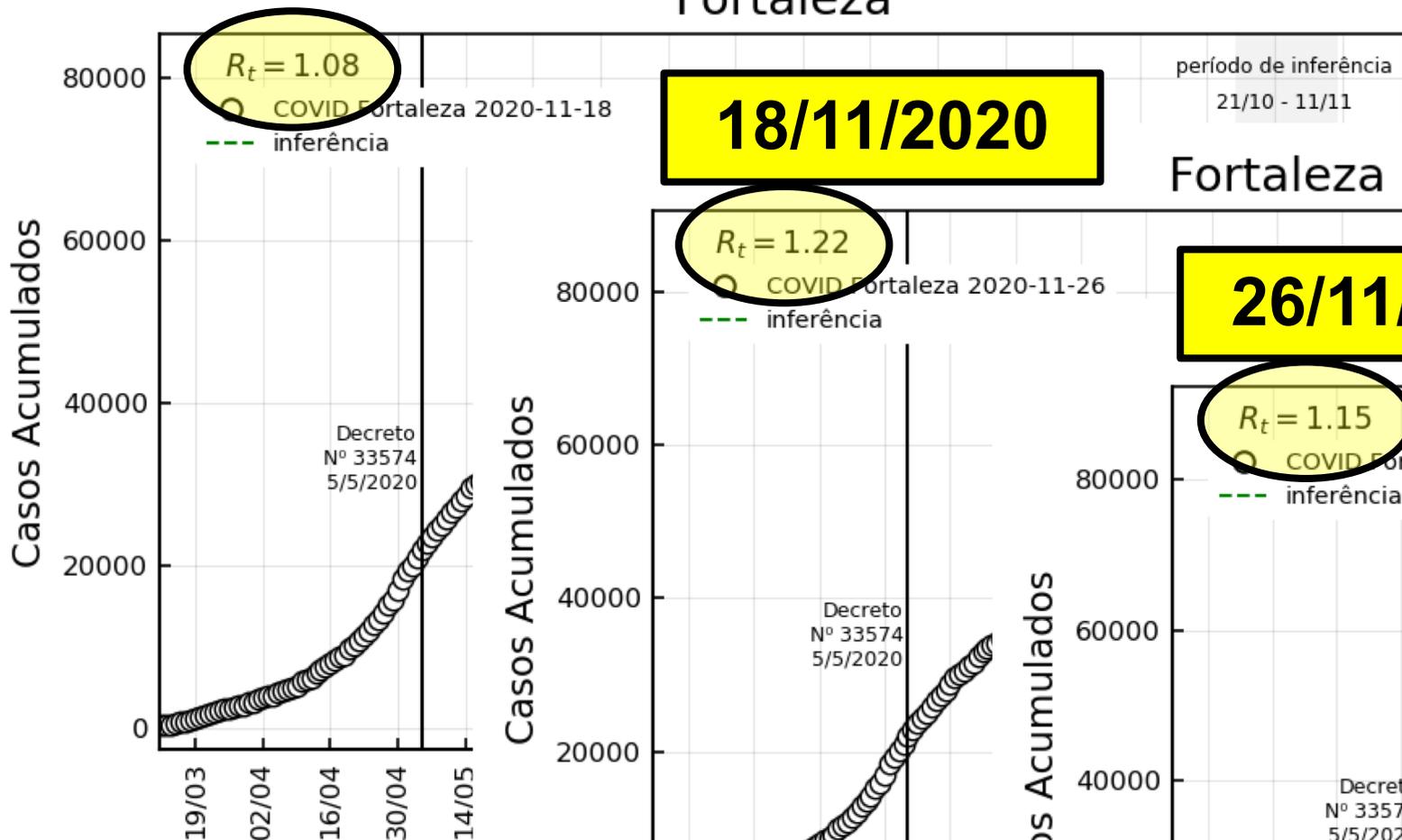
$$Letalidade(\%) = \frac{\# \acute{o}bitos (dps)}{\# casos (dps)} \times 100$$

*dps* – data dos primeiros sintomas

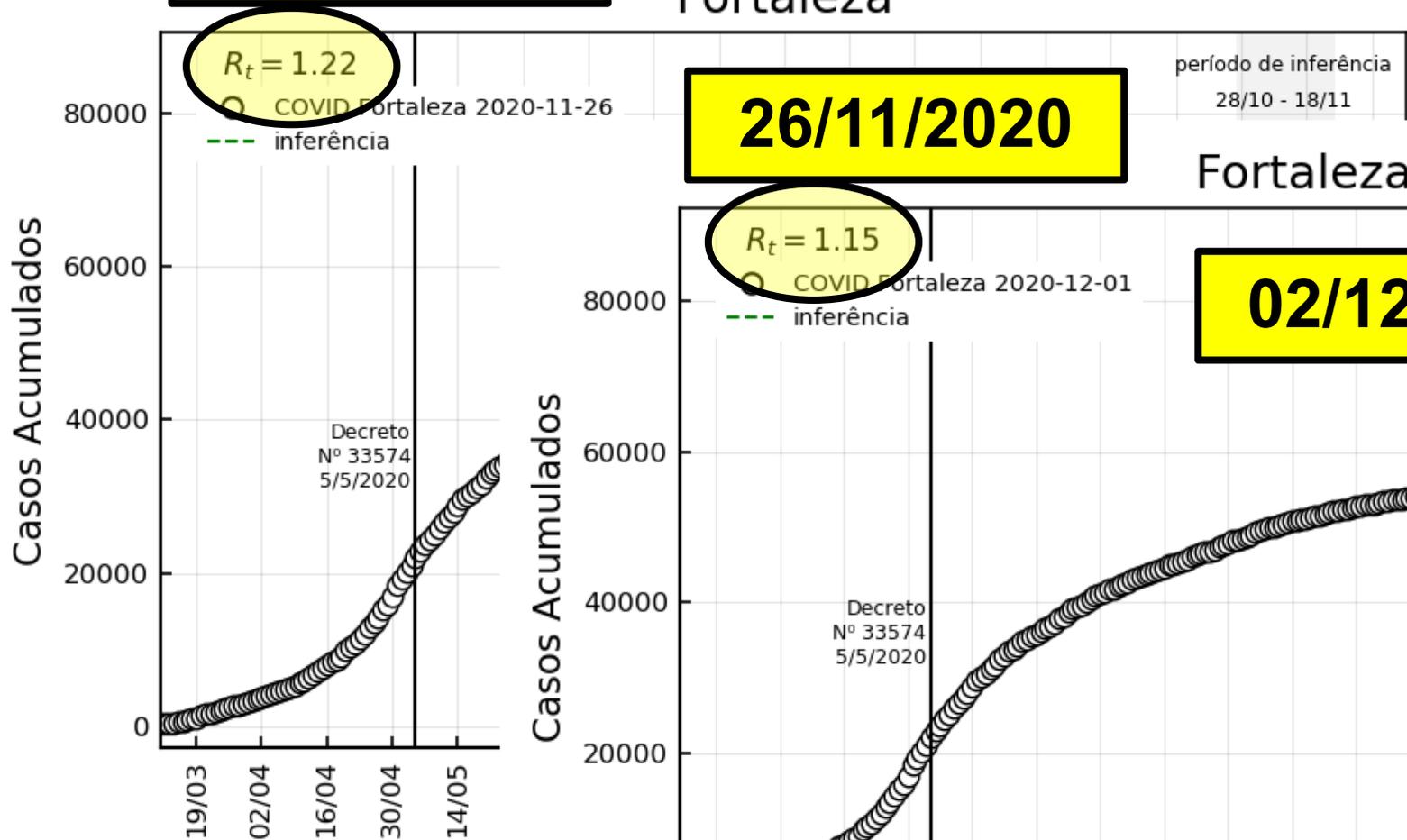


# Inferência com Casos Acumulados

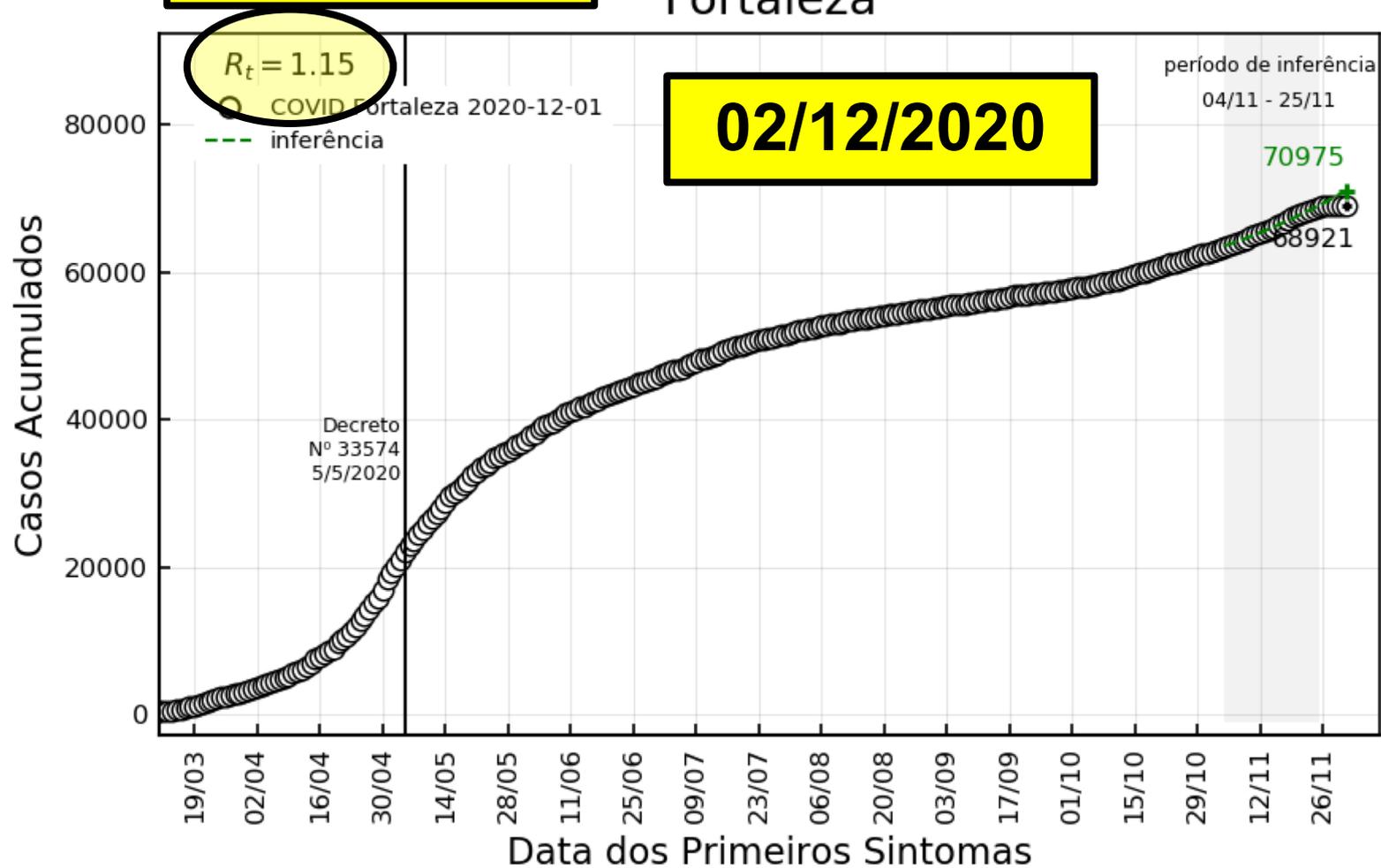
Fortaleza



Fortaleza



Fortaleza



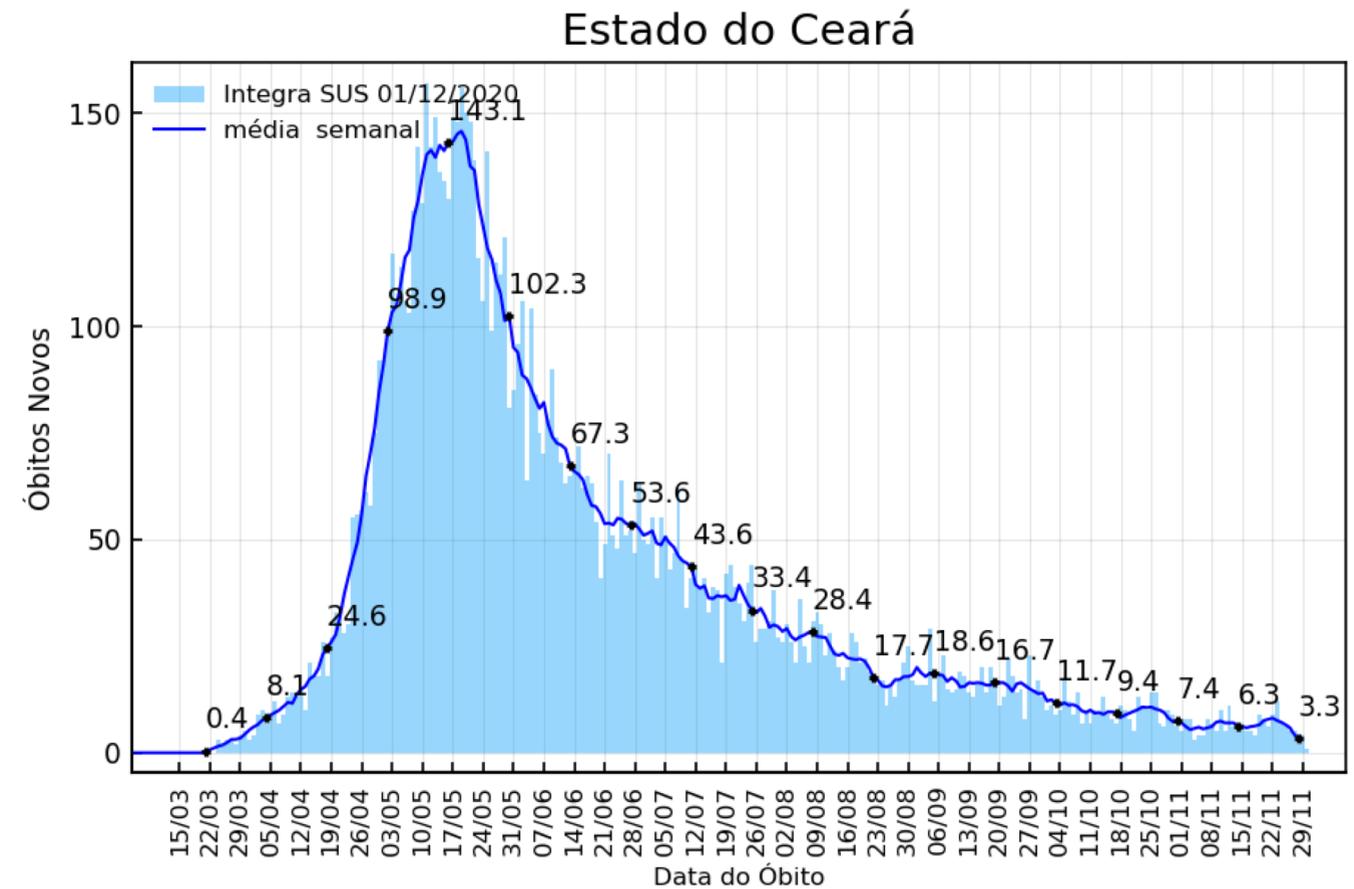
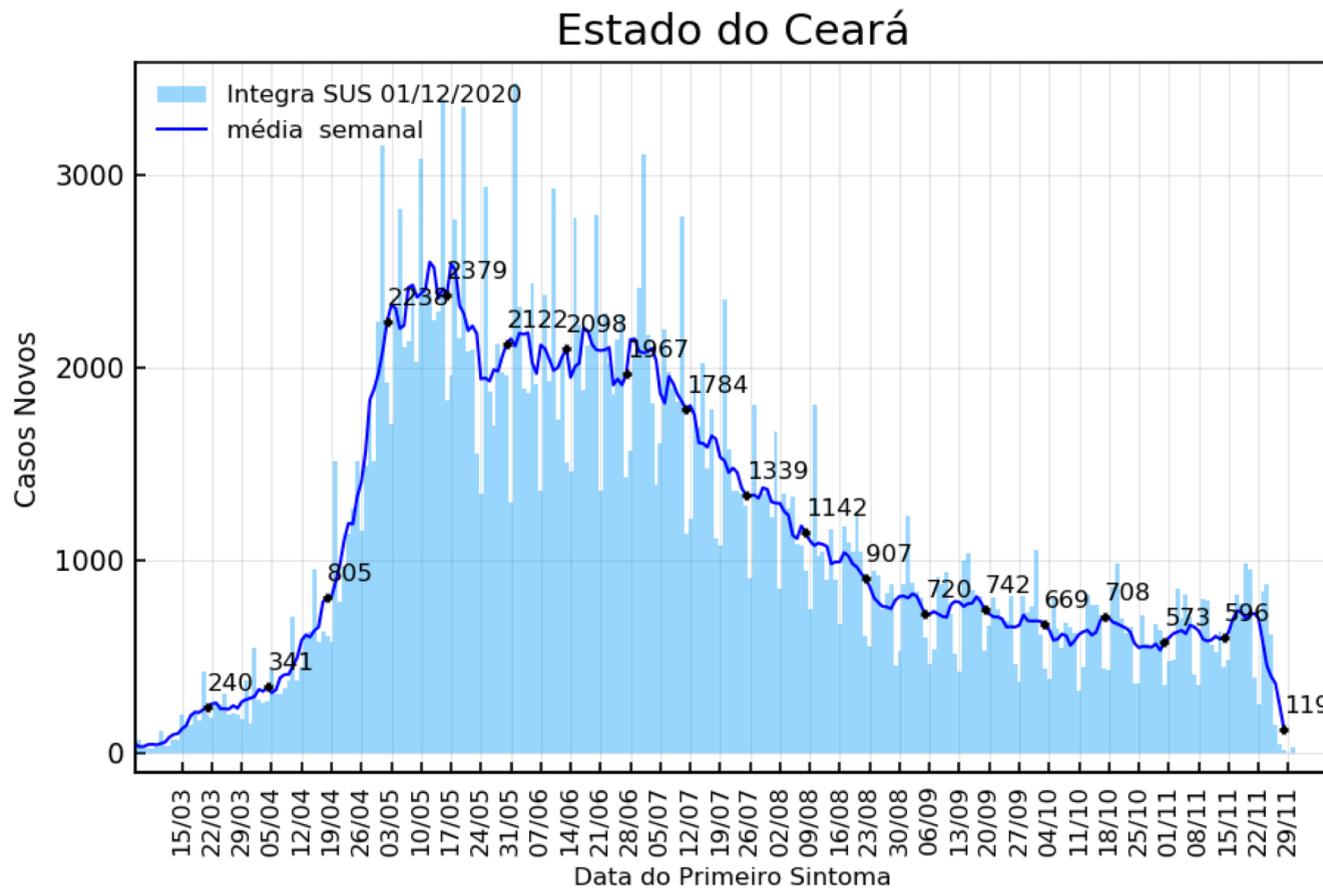
# Ceará & Regiões

REGIÃO	POPULAÇÃO (IBGE 2020)
Fortaleza	4.817.822
Sobral	1.643.656
Cariri	1.523.245
Sertão Central	652.591
Litoral Leste/Jaguaribe	549.789

População do Ceará = 9.187.103 habitantes

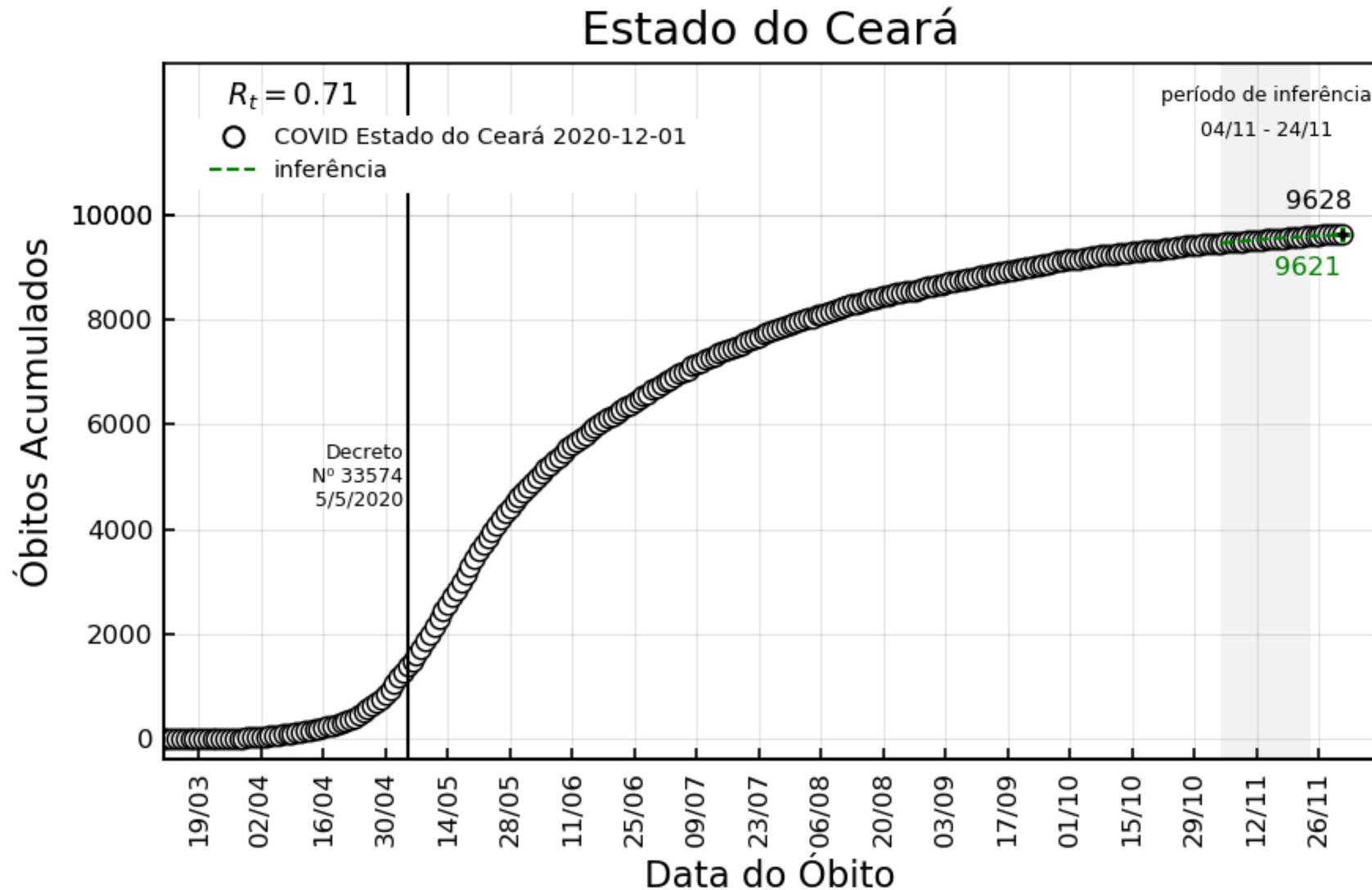
# Estado do Ceará

## Dados atualizados em 02/12/2020



# Dados atualizados em 02/12/2020

## Inferência com Óbitos



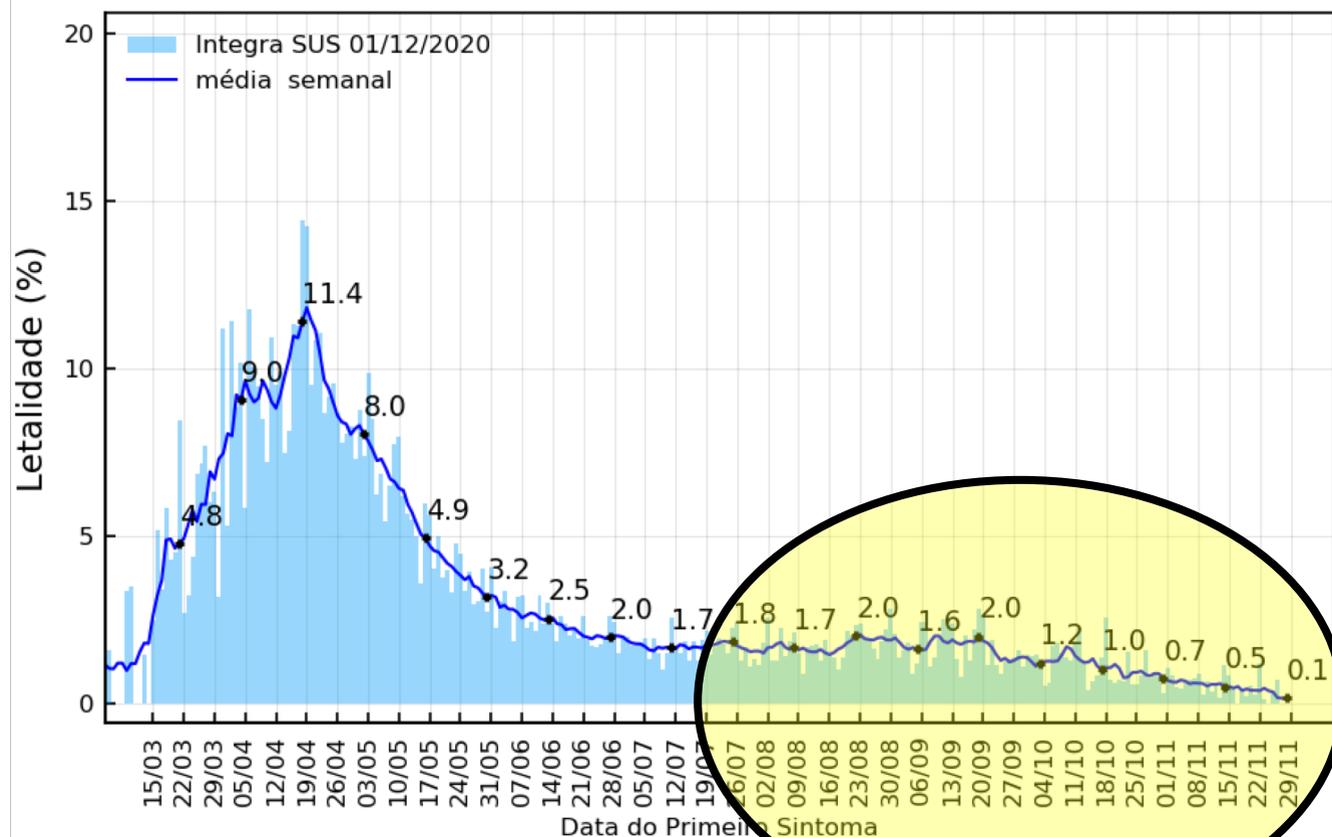
Janela de Inferência	$R_t$
16/09 – 08/10	0.63
23/09 – 15/10	0.67
30/09 – 22/10	0.69
07/10 – 29/10	0.68
14/10 – 03/11	0.67
21/10 – 10/11	0.62
28/10 – 17/11	0.62
04/11 – 24/11	0.71

# Letalidade

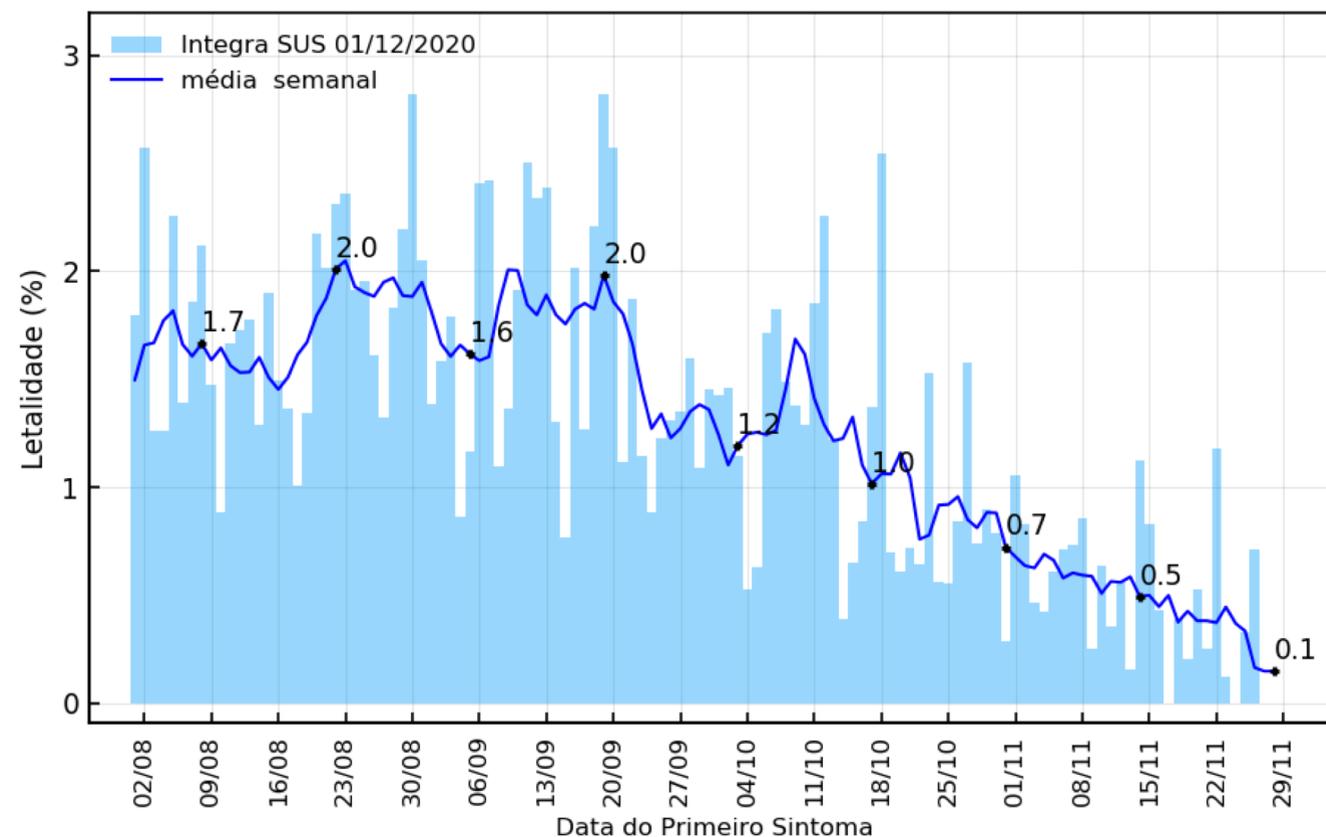
$$Letalidade(\%) = \frac{\# \acute{o}bitos (dps)}{\# casos (dps)} \times 100$$

*dps* – data dos primeiros sintomas

Estado do Ceará



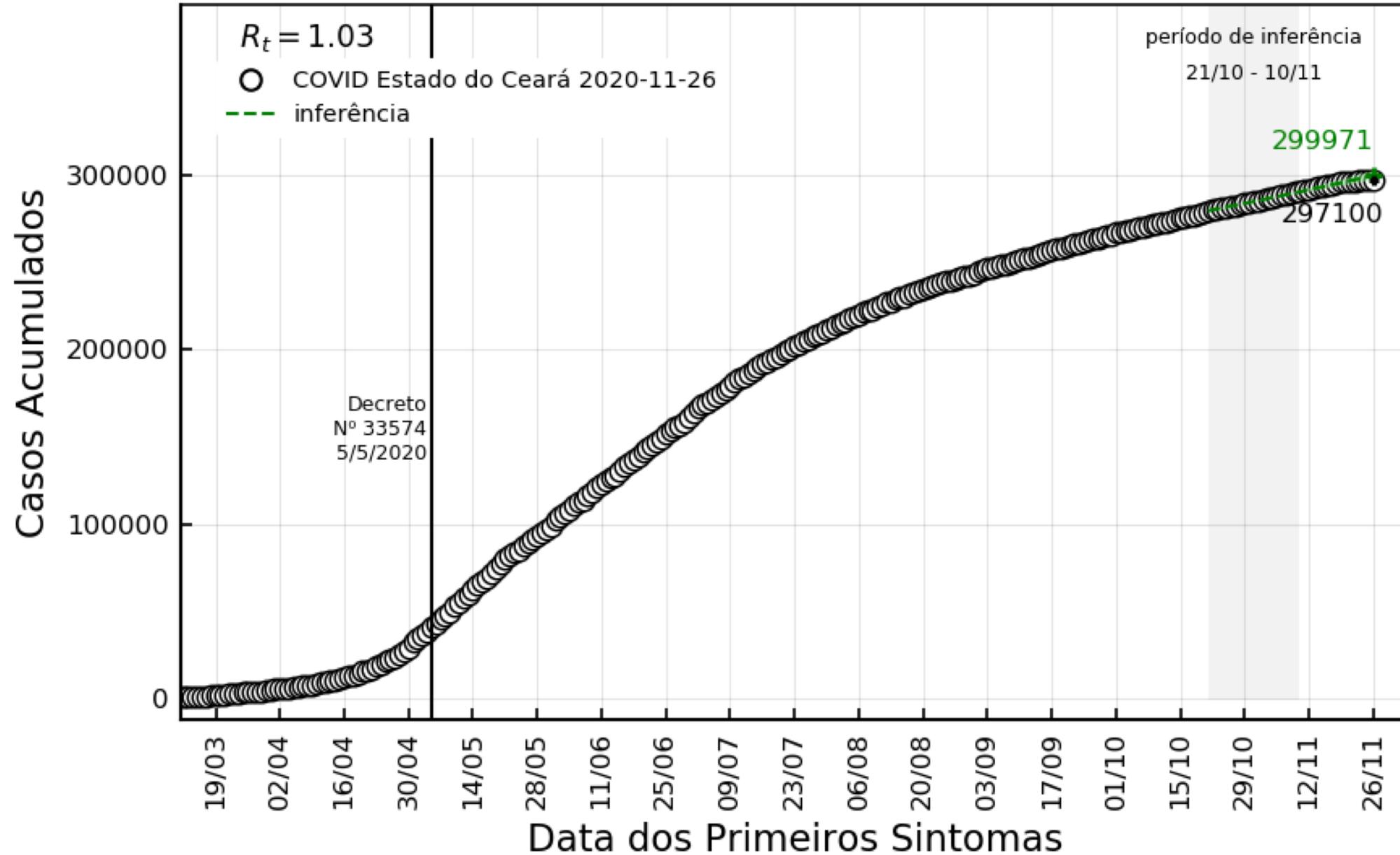
Estado do Ceará



# Inferência com Casos Acumulados 26/11/2020

## Resultados Preliminares

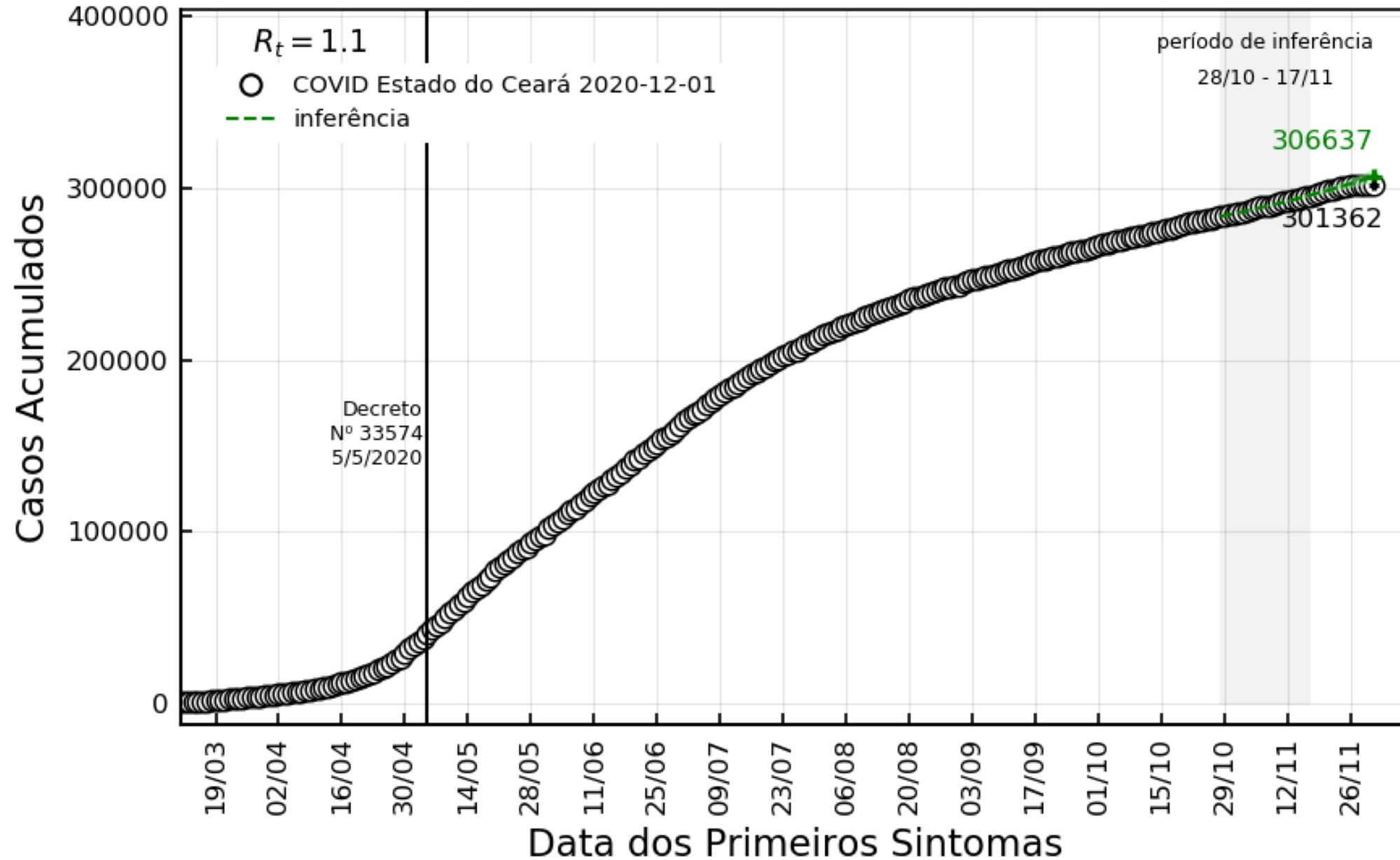
### Estado do Ceará



# Inferência com Casos Acumulados 02/12/2020

## Resultados Preliminares

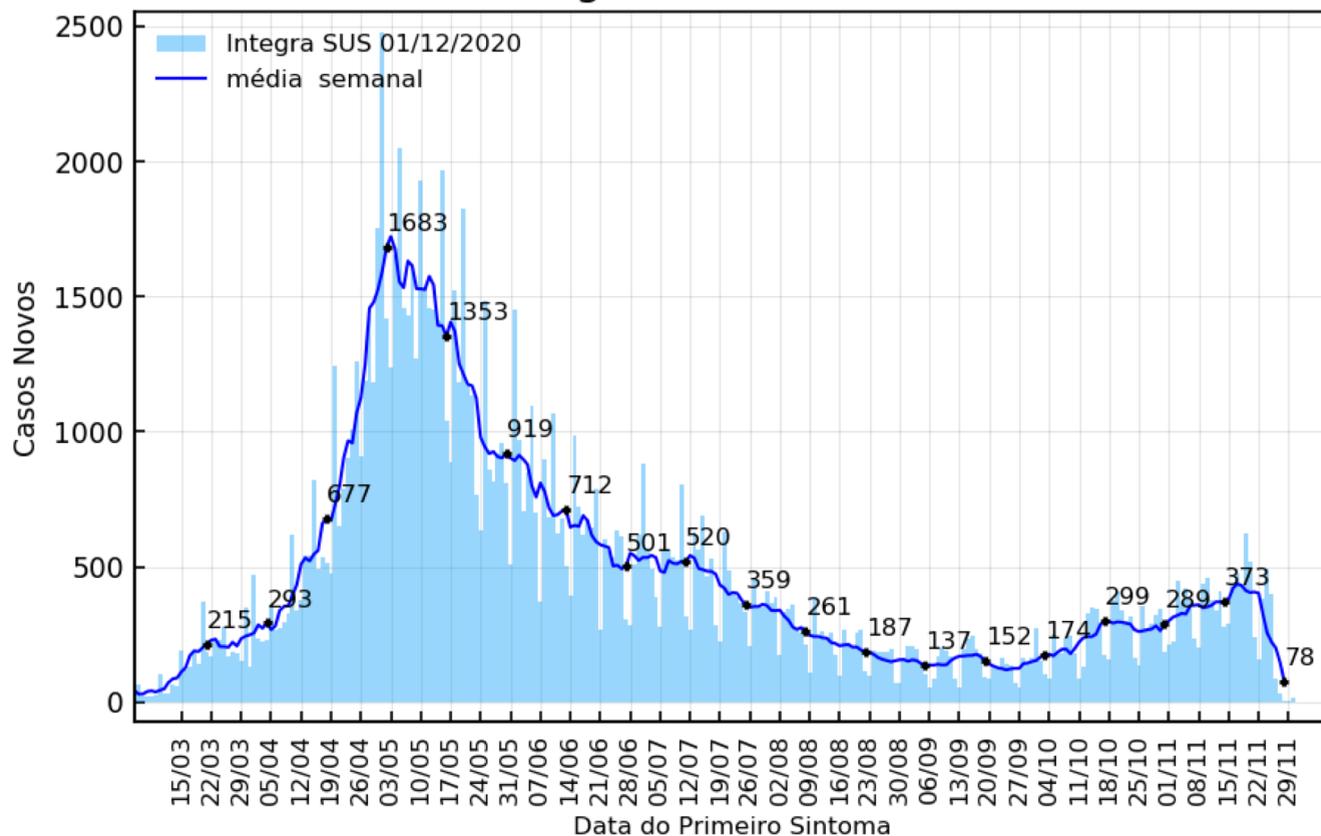
### Estado do Ceará



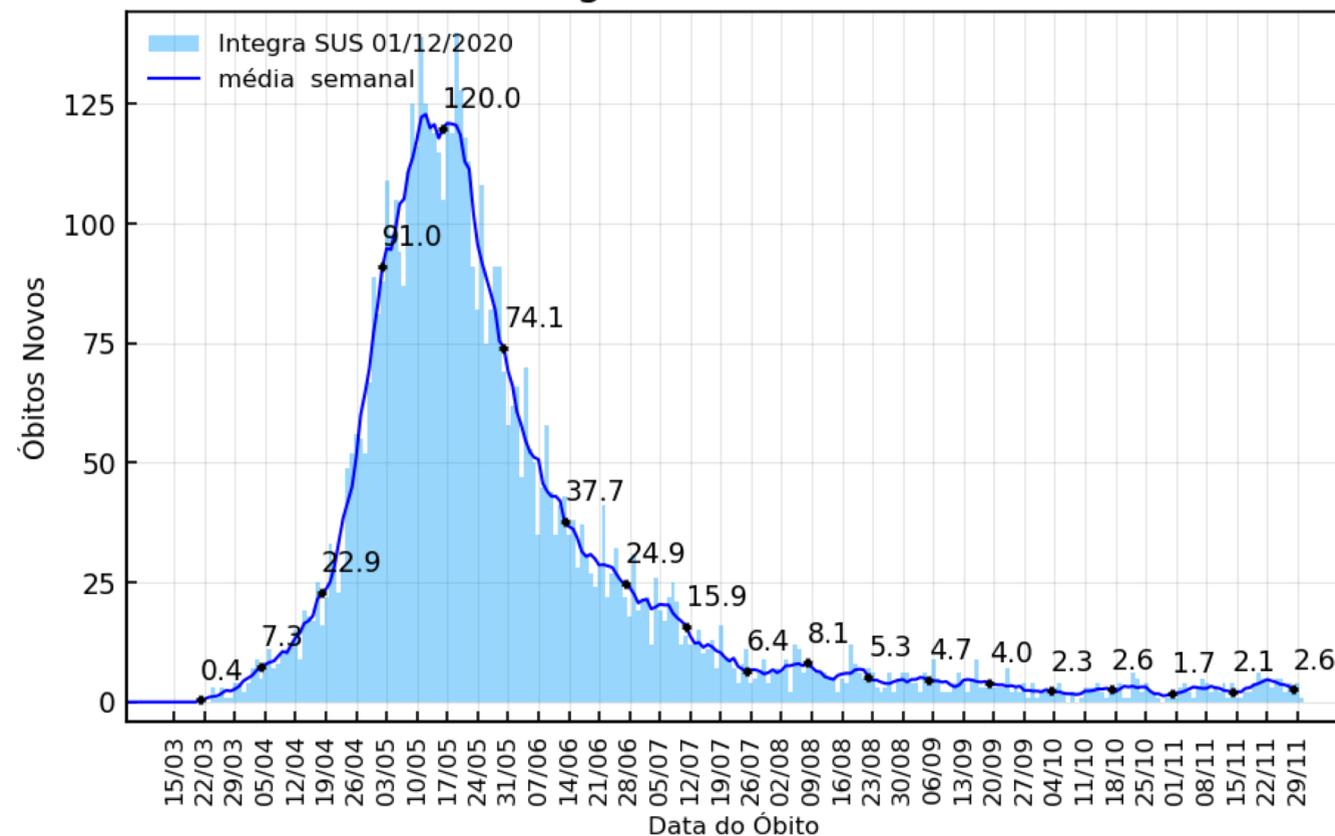
# Região Fortaleza

# Dados atualizados em 02/12/2020

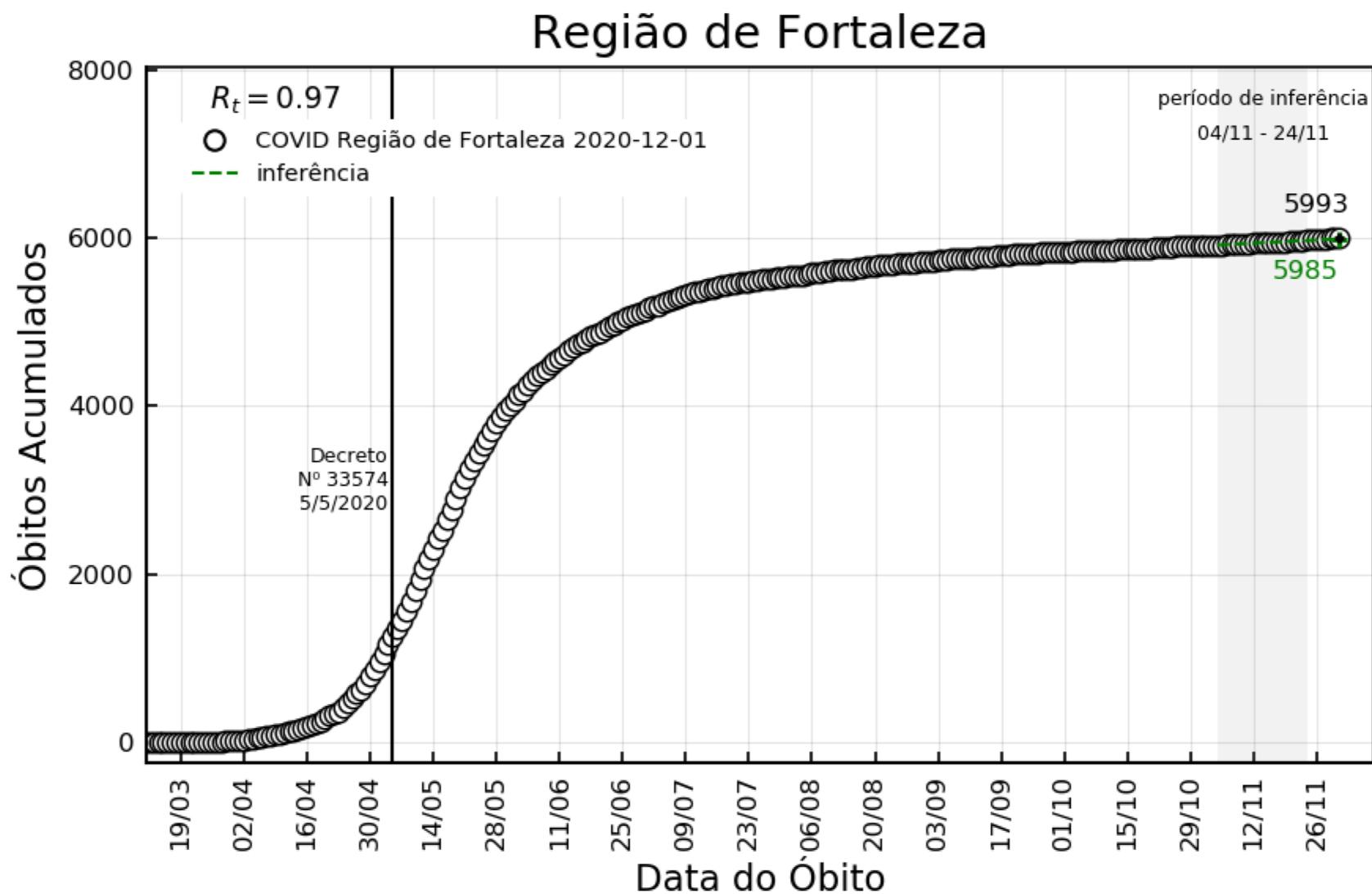
Região de Fortaleza



Região de Fortaleza



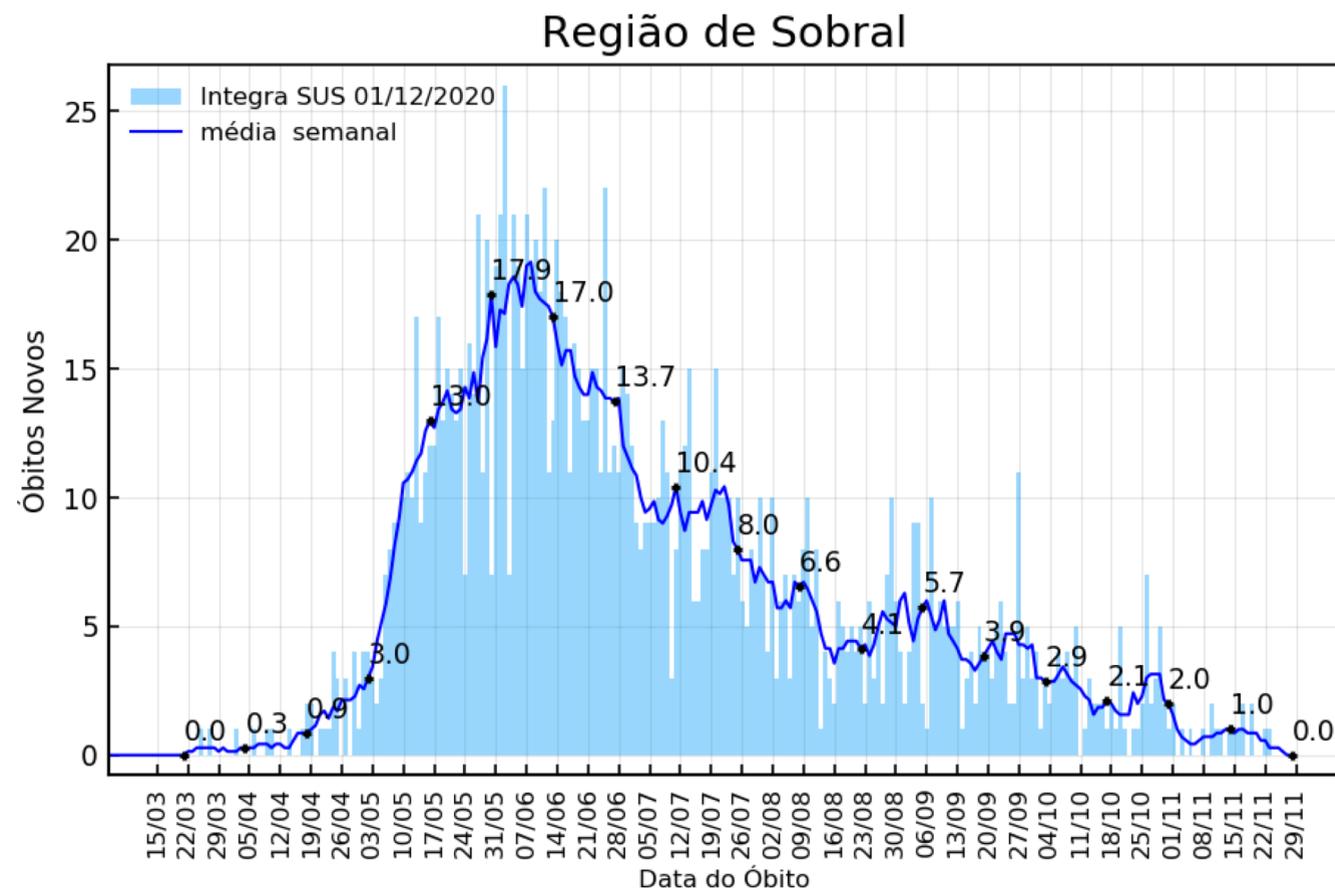
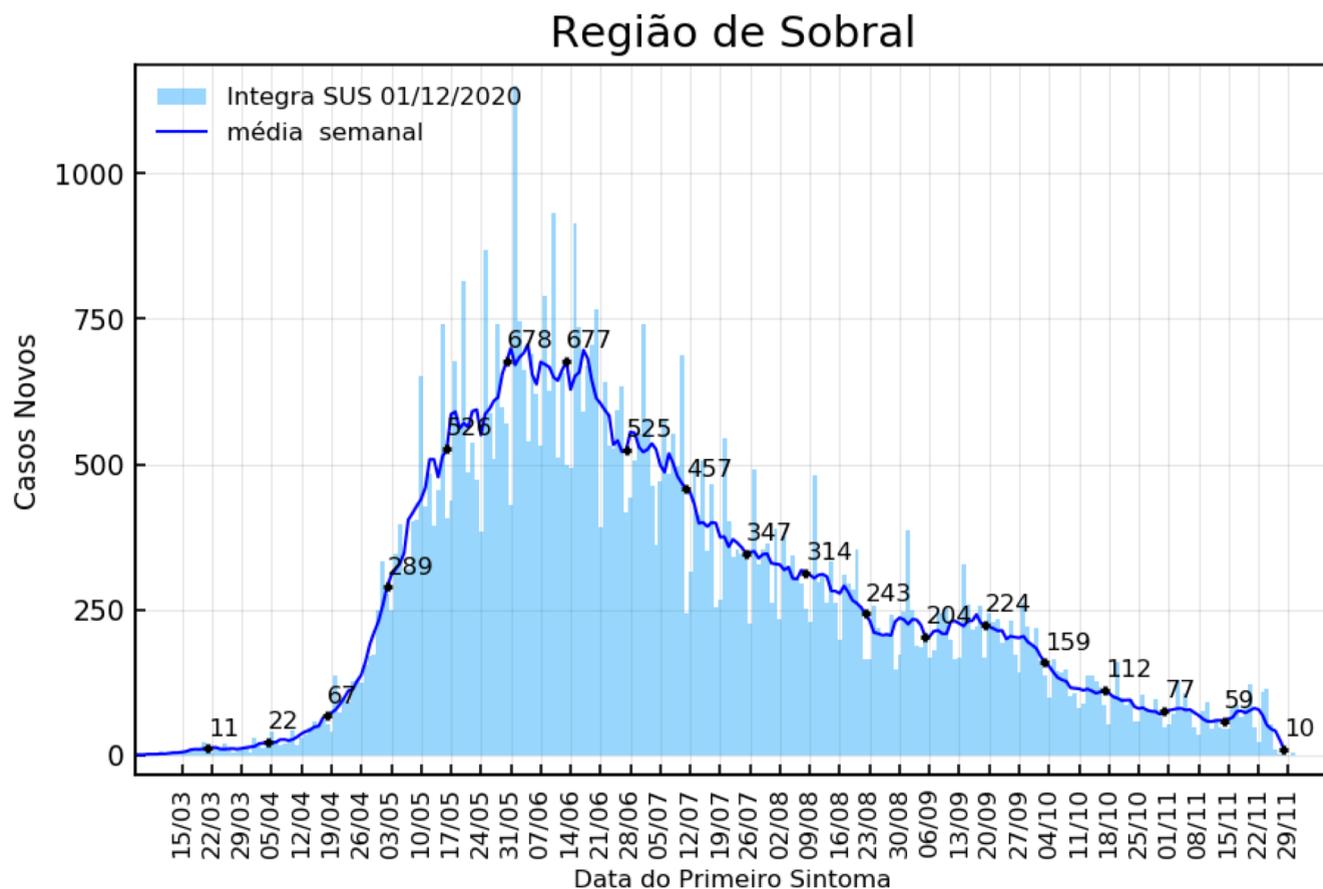
# Dados atualizados em 02/12/2020



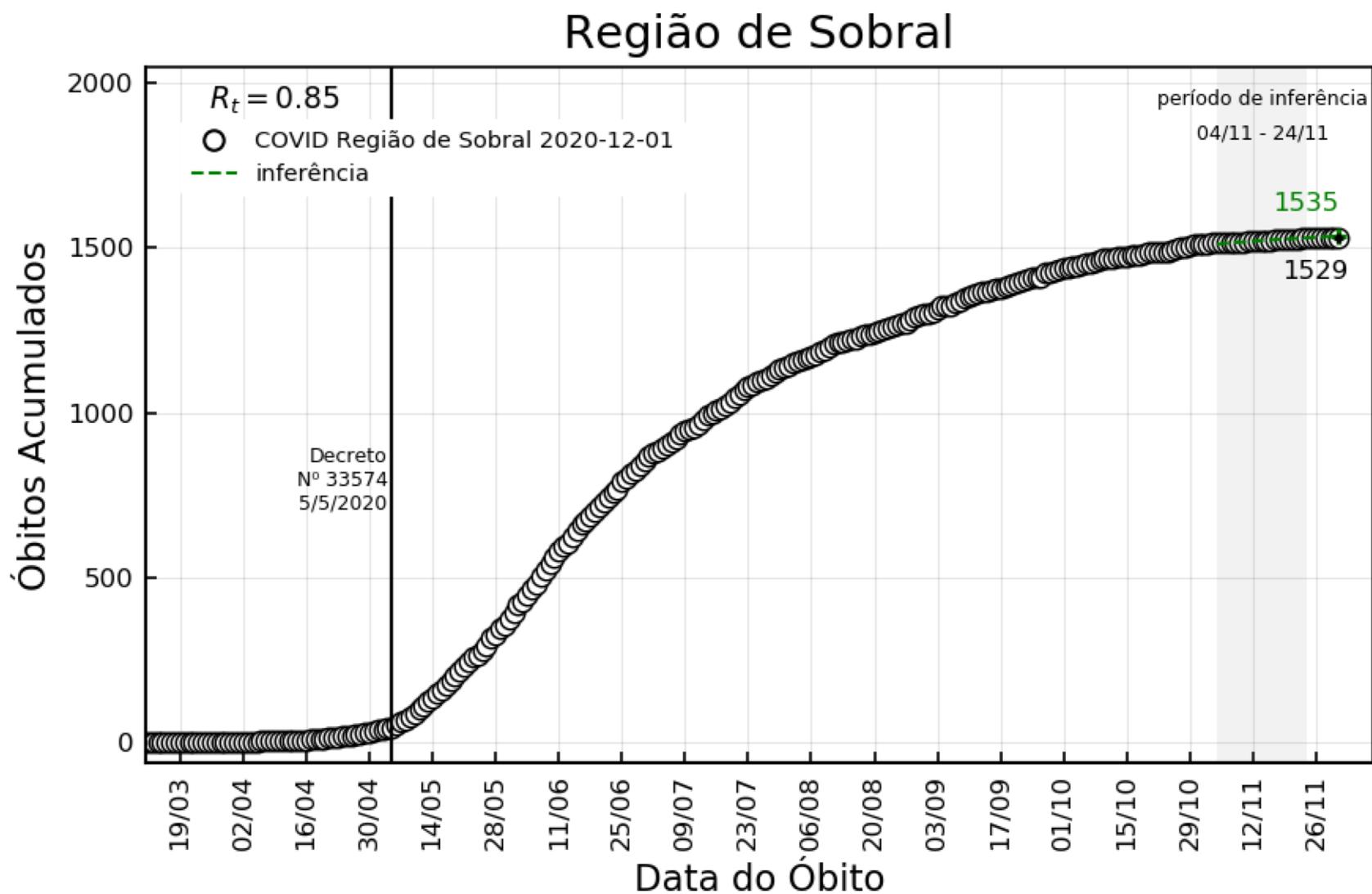
Janela de Inferência	$R_t$
09/09 – 01/10	0.75
16/09 – 08/10	0.75
23/09 – 15/10	0.76
30/09 – 22/10	0.77
07/10 – 29/10	0.72
14/10 – 03/11	0.72
21/10 -10/11	0.76
28/10 – 17/11	0.91
04/11 – 24/11	0.97

# Região Sobral

# Dados atualizados em 02/12/2020



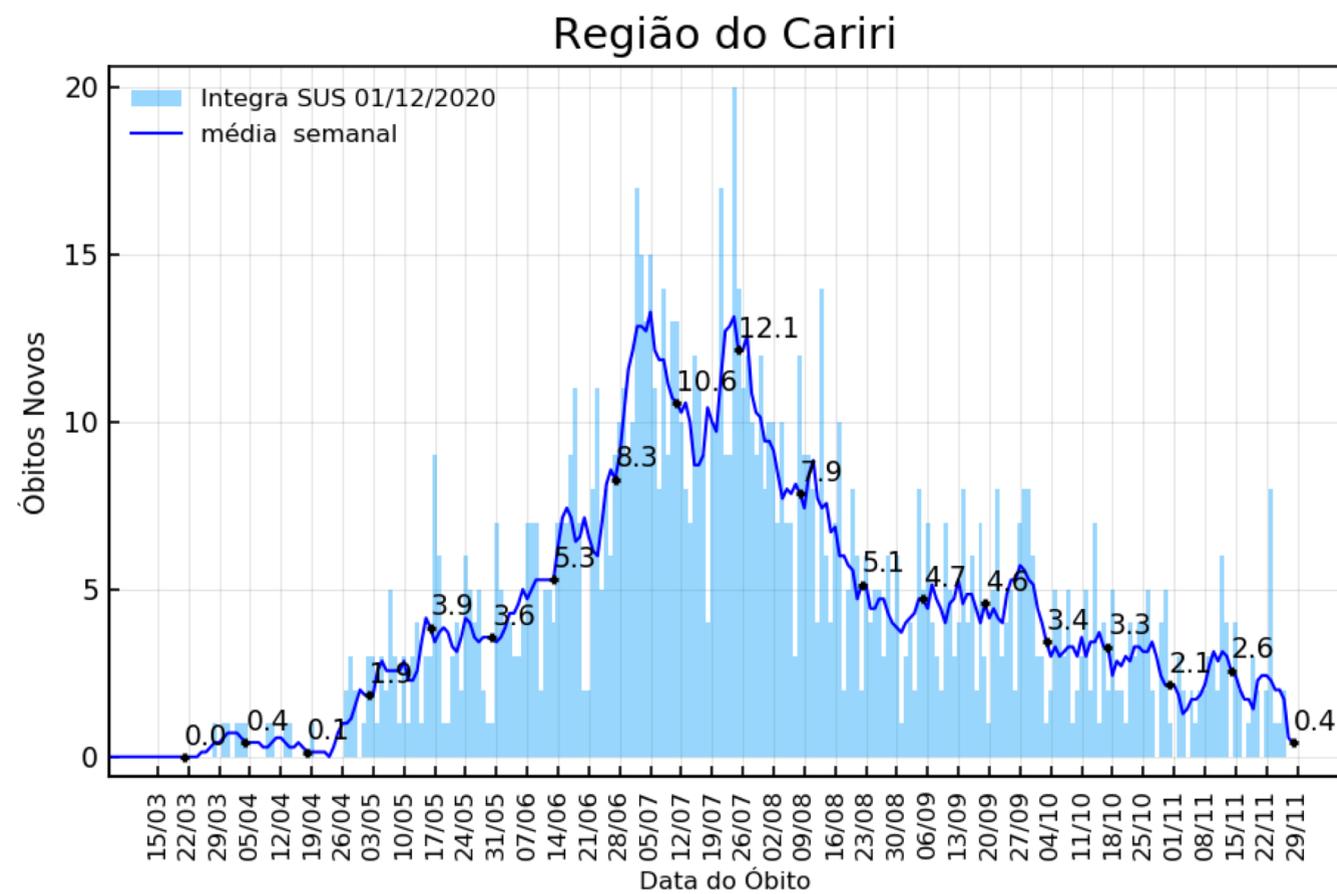
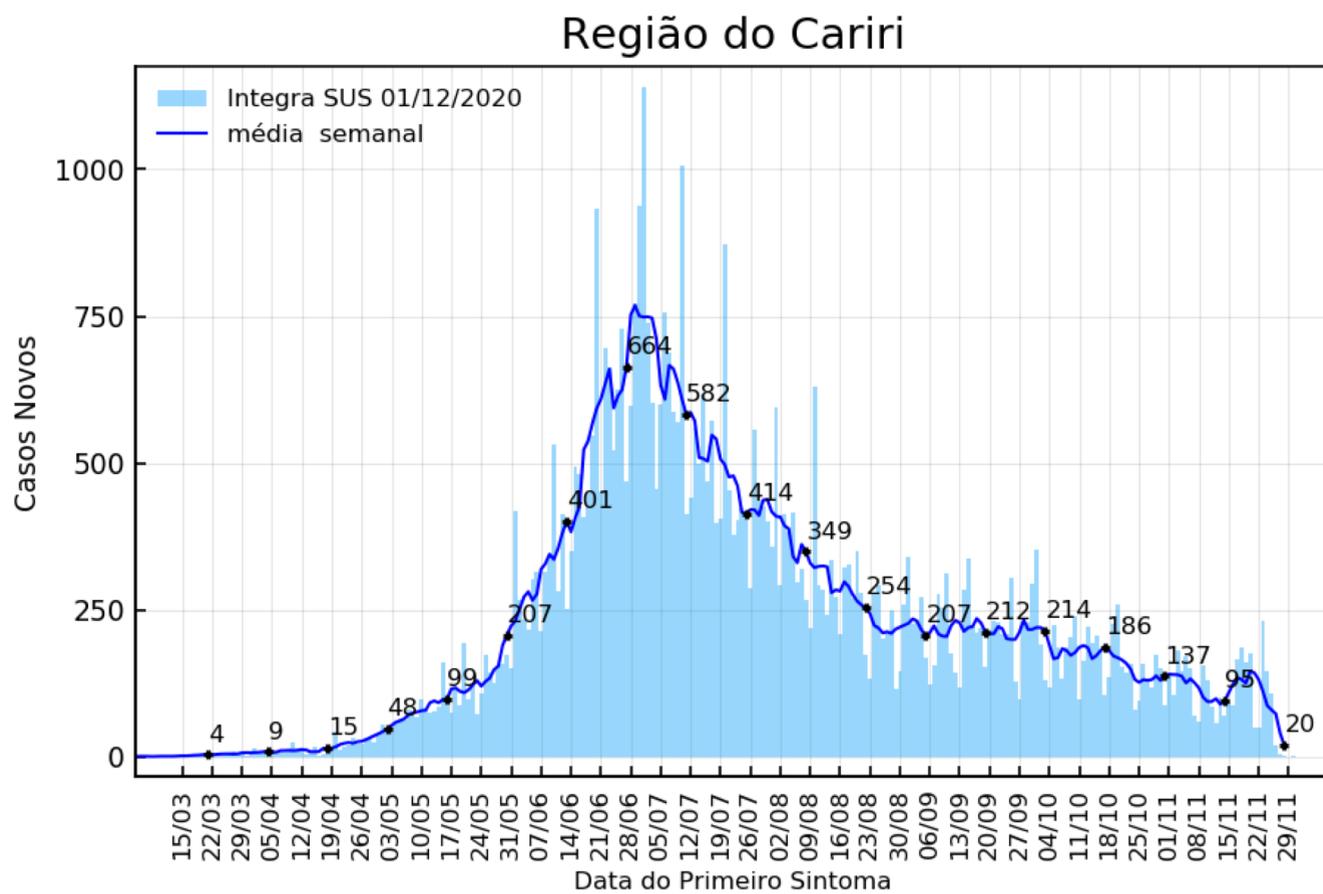
# Dados atualizados em 02/12/2020



Janela de Inferência	$R_t$
09/09 – 01/10	0.97
16/09 – 08/10	0.84
23/09 – 15/10	0.84
30/09 – 22/10	0.71
07/10 – 29/10	0.84
14/10 – 03/11	0.90
21/10 – 10/11	0.88
28/10 – 17/11	0.83
04/11 – 24/11	0.85

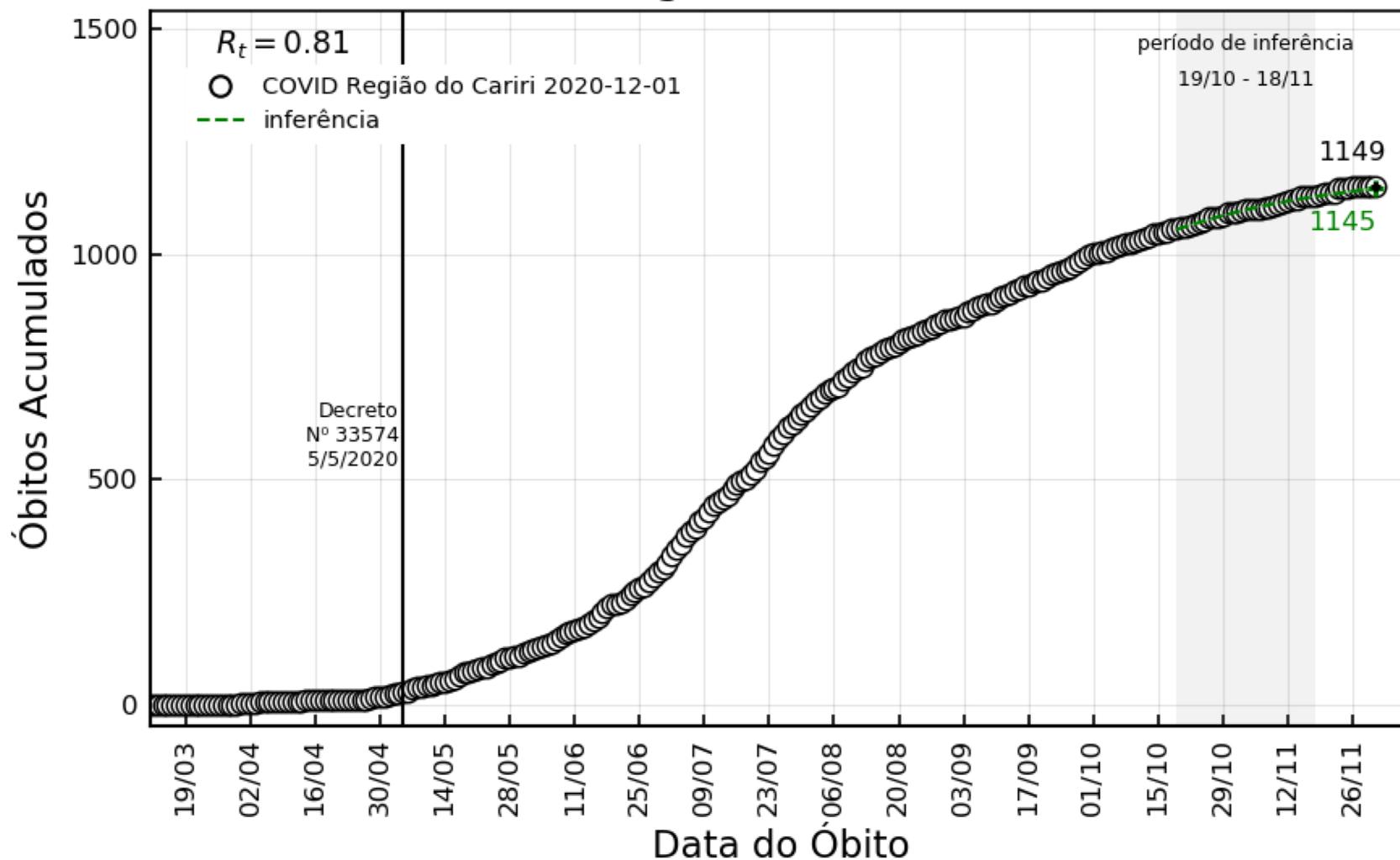
# Região Cariri

# Dados atualizados em 02/12/2020



# Dados atualizados em 02/12/2020

## Região do Cariri

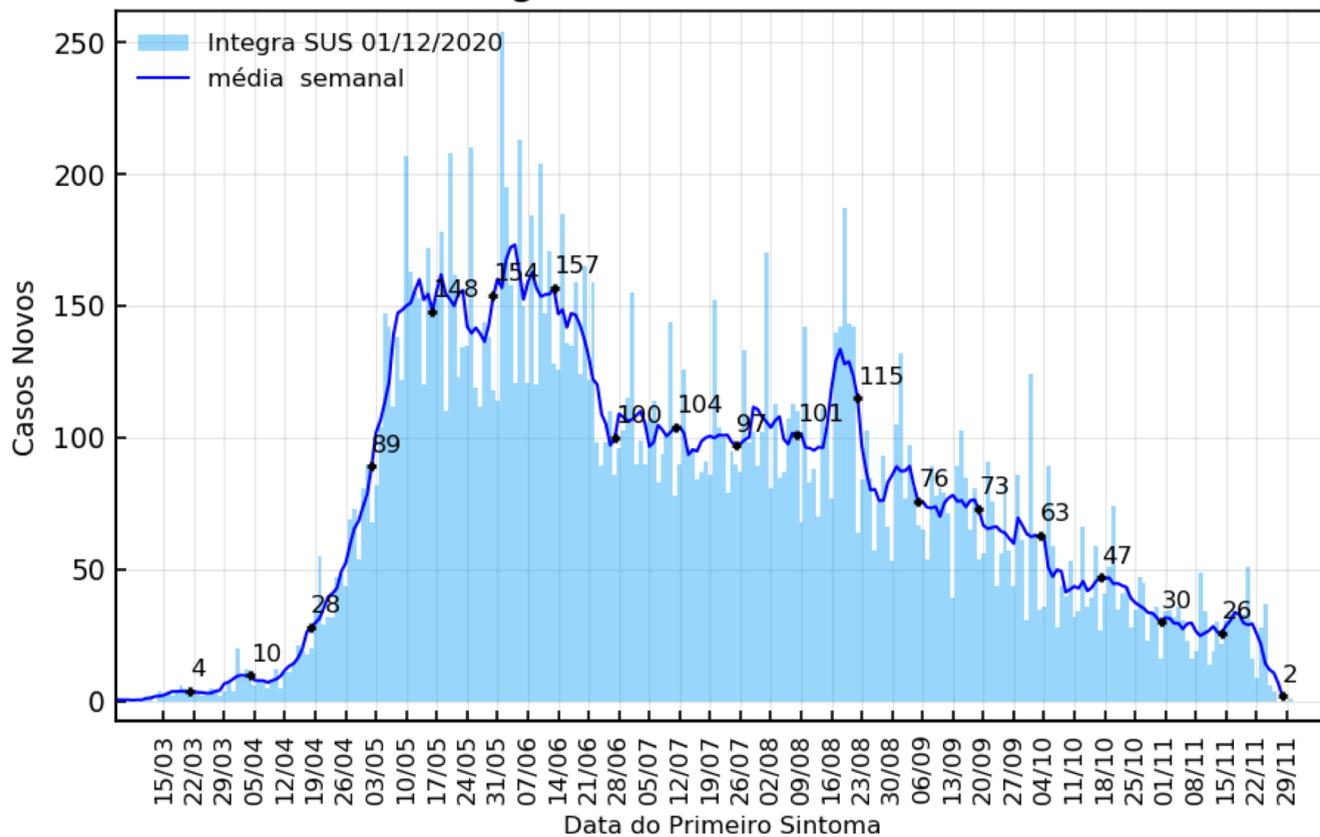


Janela de Inferência	$R_t$
07/09 – 07/10	1.07
14/09 – 14/10	0.86
21/09 – 21/10	0.86
28/09 – 28/10	0.80
05/10 – 04/11	0.81
12/10 – 11/11	0.78
19/10 – 18/11	0.81

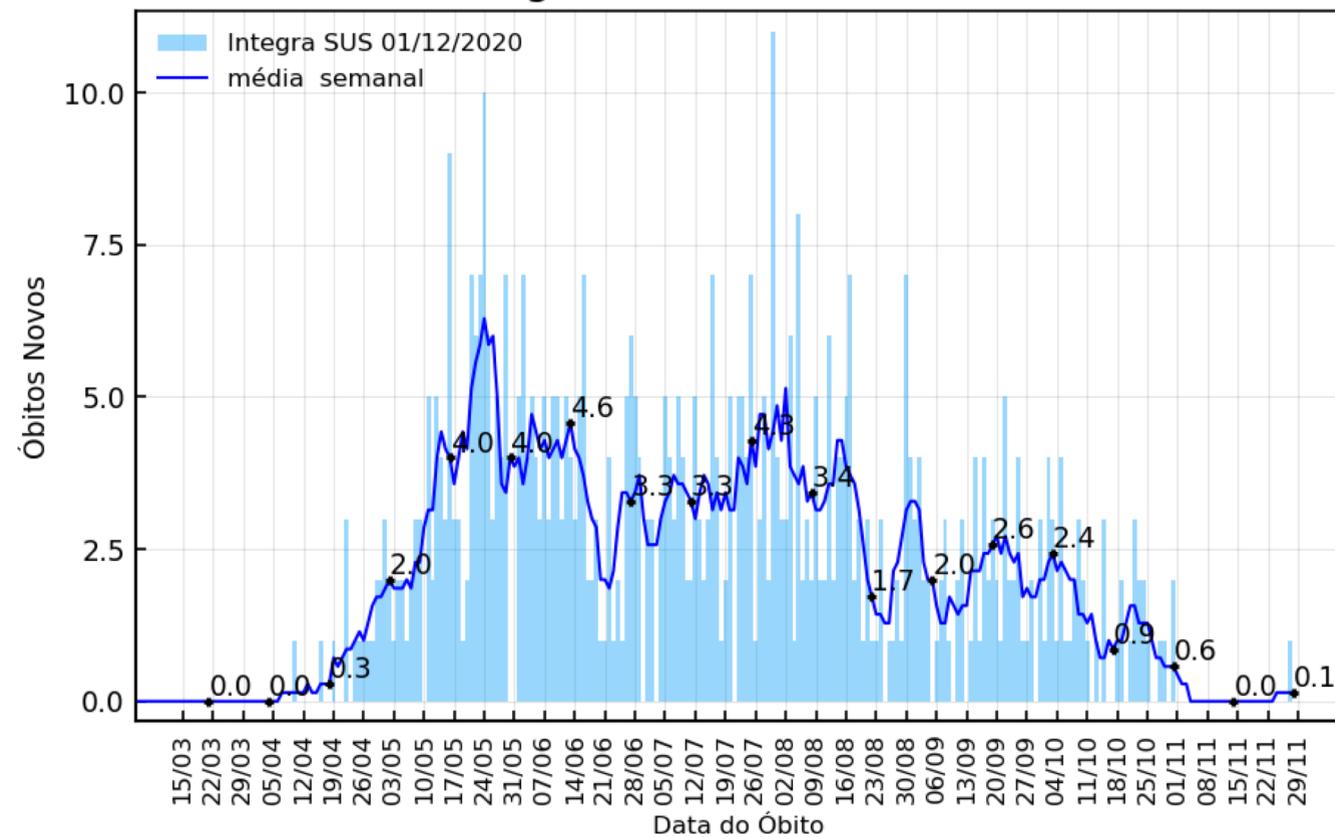
# Região Sertão Central

# Dados atualizados em 02/12/2020

## Região do Sertão Central

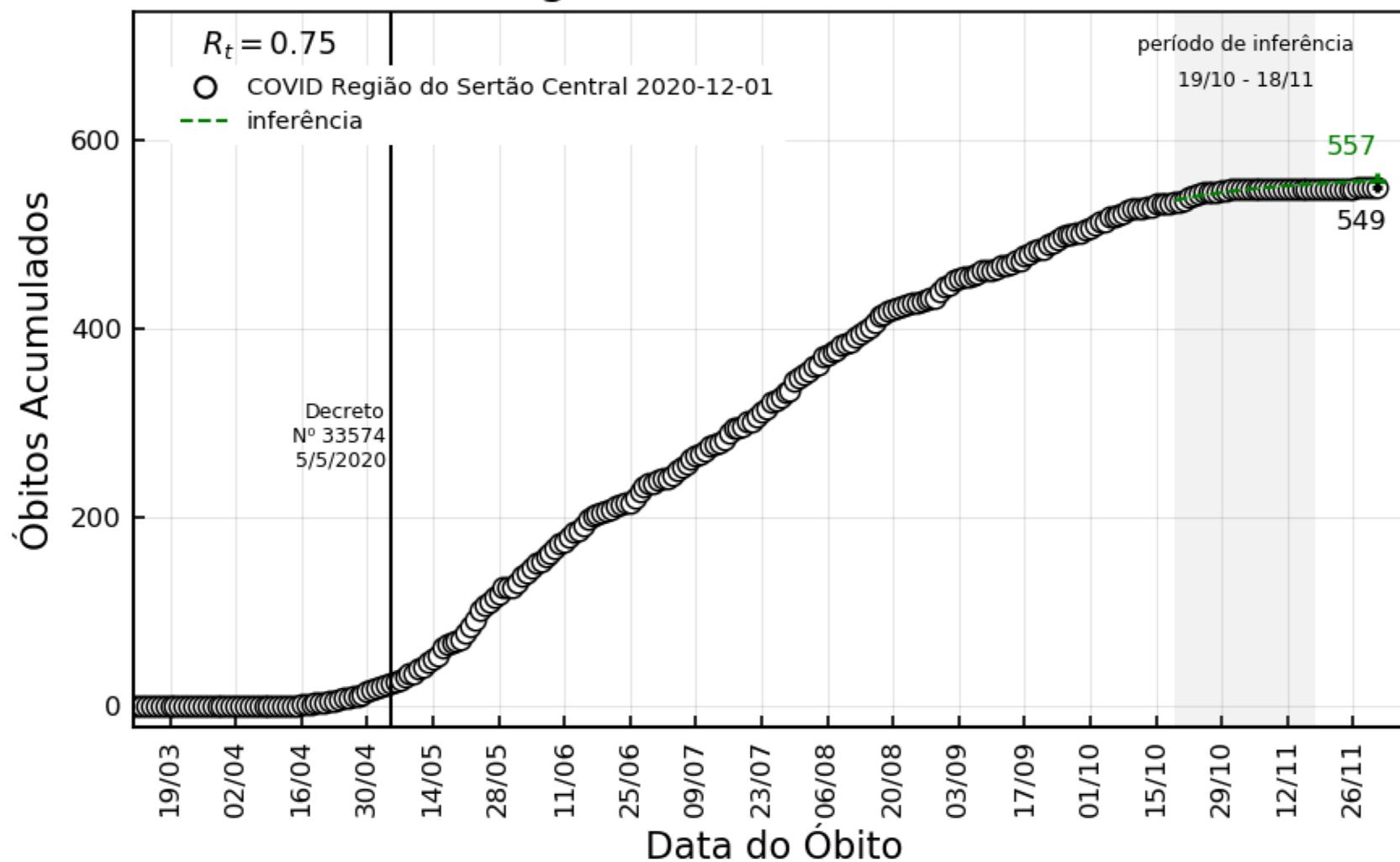


## Região do Sertão Central



# Dados atualizados em 02/12/2020

## Região do Sertão Central



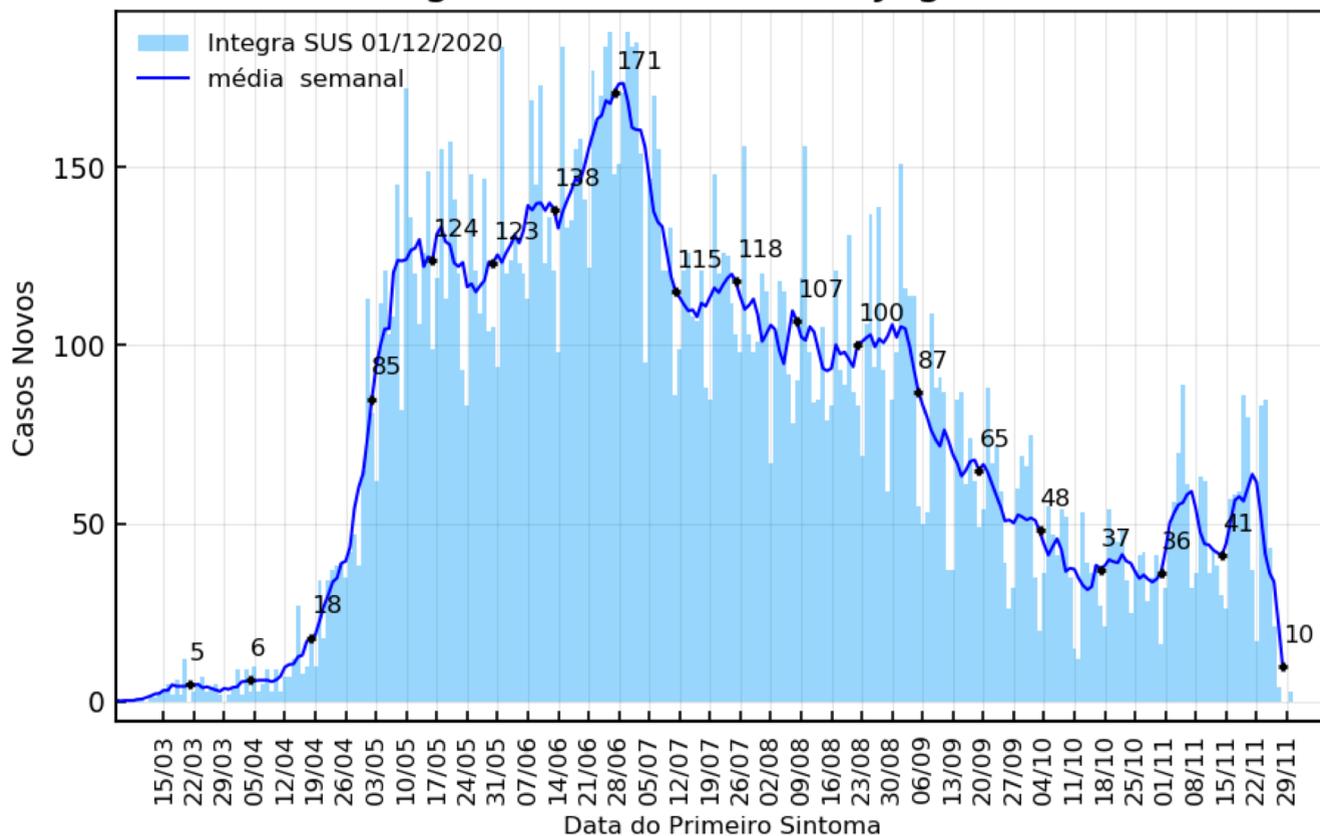
Janela de Inferência	$R_t$
30/08 – 29/09	0.84
07/09 – 07/10	0.91
14/09 – 14/10	0.78
21/09 – 21/10	0.75
28/09 – 28/10	0.87
05/10 – 04/11	0.83
12/10 – 11/11	0.78
19/10 – 18/11	0.75

# **Região**

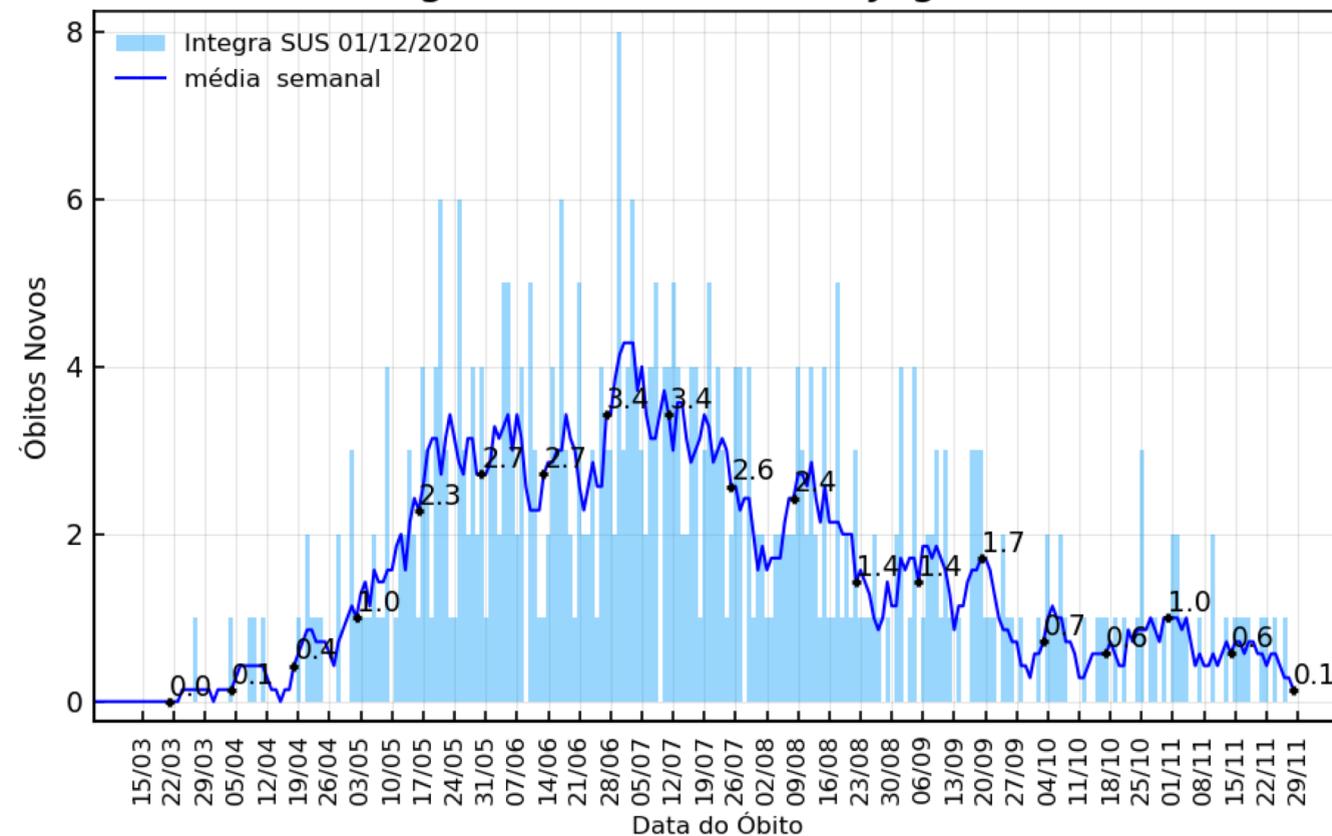
## **Litoral Leste/Jaguaribe**

# Dados atualizados em 02/12/2020

## Região do Litoral Leste/Jaguaribe

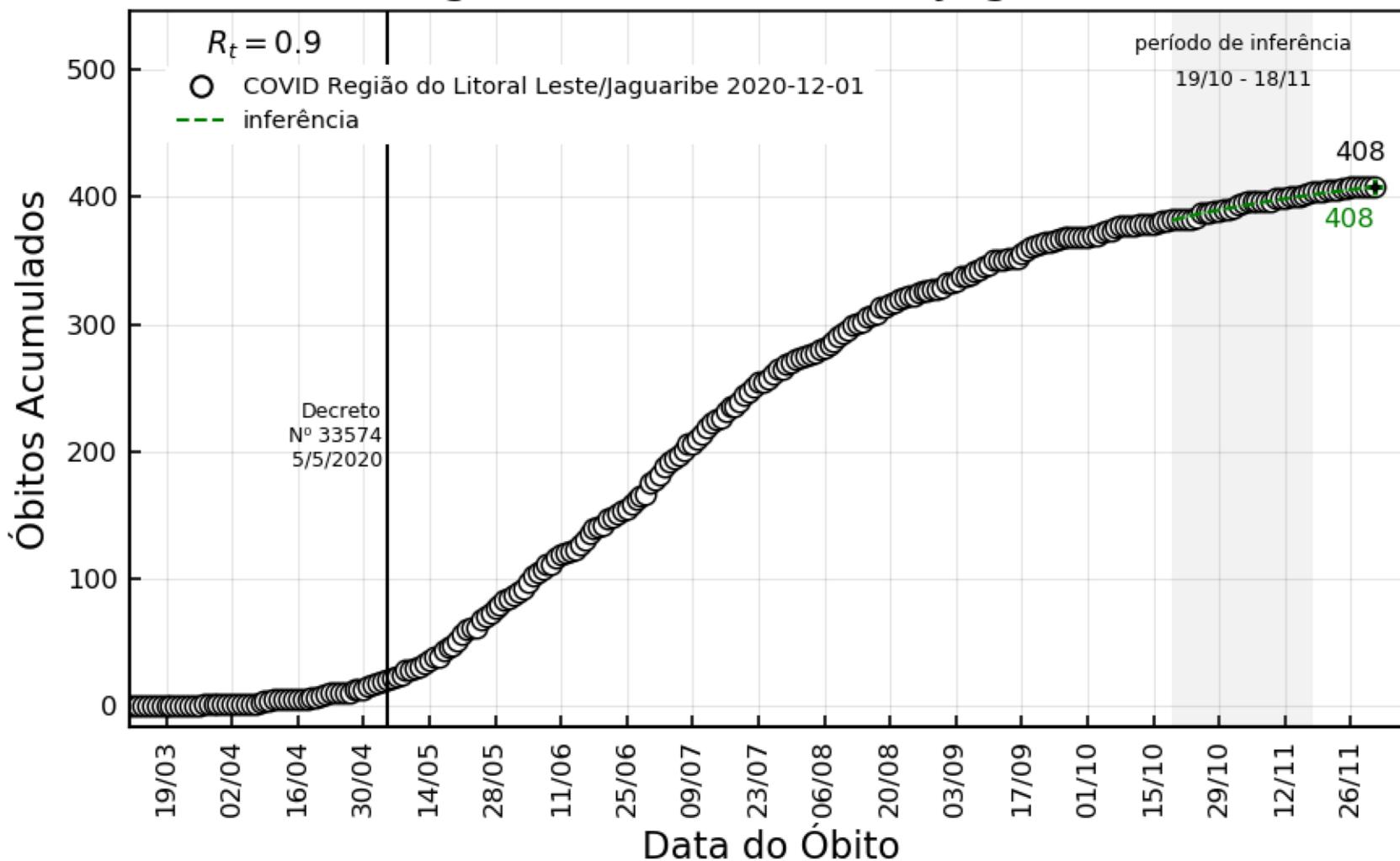


## Região do Litoral Leste/Jaguaribe



# Dados atualizados em 02/12/2020

Região do Litoral Leste/Jaguaribe



Janela de Inferência	$R_t$
07/09 – 07/10	0.82
14/09 – 14/10	0.86
21/09 – 21/10	0.92
28/09 – 28/10	0.81
05/10 – 04/11	0.87
12/10 – 11/11	0.88
19/10 – 18/11	0.90