The impact of social and physical distancing measures on COVID-19 activity in England

AIM

- To describe how the impact SPDM was detected through each surveillance system and how these systems may be applied to detect increases in COVID-19 activity as SPDM are eased.

Methods

- from the start of the epidemic to Week 20 2020 Data were used from
  - national population surveys,
  - web-based indicators,
  - syndromic surveillance,
  - sentinel swabbing,
  - respiratory outbreaks,
  - secondary care admissions, and
  - mortality indicators
- to identify timing of peaks in the indicator relative to the introduction of SPDM.
- This was compared to median time from symptom onset to different stages of illness or interactions with healthcare services.

Time after infection	0 days		5-6 days		8-9 days	8-9 days	9-10 days	14-15 days	19-20 days
Stage of illness	Exposure/ infection		Onset of symptoms		First contact with health services		Hospitalisation	ICU admission	Mortality
Laboratory testing						Primary care testing		Hospital testing	
Surveillance systems			Community syndromic surveillance		Primary care syndromic surveillance	GP sentinel swabbing	Hospital admissions, ED syndromic surveillance	Laboratory surveillance	ICU admissions	COVID-19 deaths All-cause mortality

England - Measures

- end January: First cases
- March 12
  - Symptomatic persons self-isolate 7 days
  - School trips cancelled
  - At risk persons: No cruises
- March 16
  - Advice against non-essential travel
  - No non-essential contact
  - Work from home
- March 23
  - School closure
  - Require to stay at home
  - Closing certain buisiness and venues
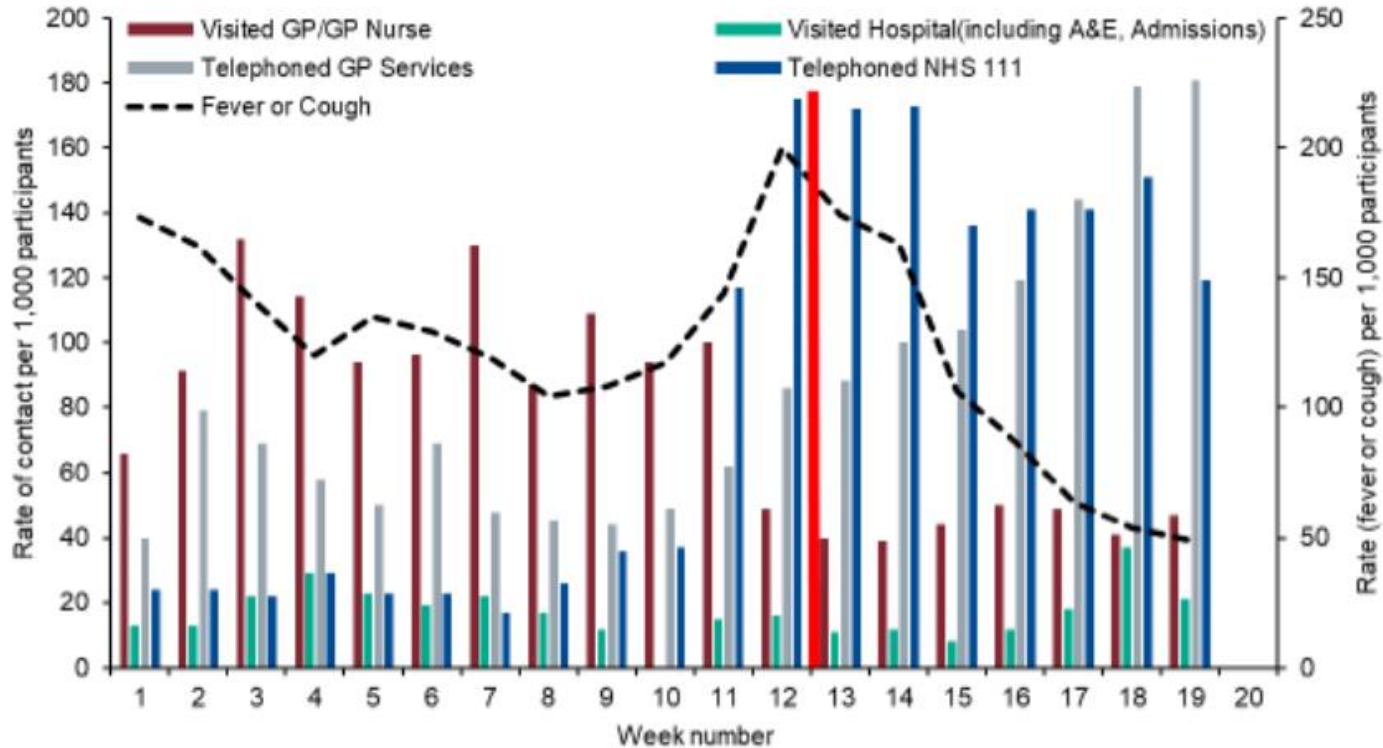 - No more than 2 people in public

Results - Survey

Figure 2: Rate of fever or cough among FluSurvey participants and their contact with different healthcare services, week 09 to 18. Red vertical line indicates introduction of mandatory SPDM
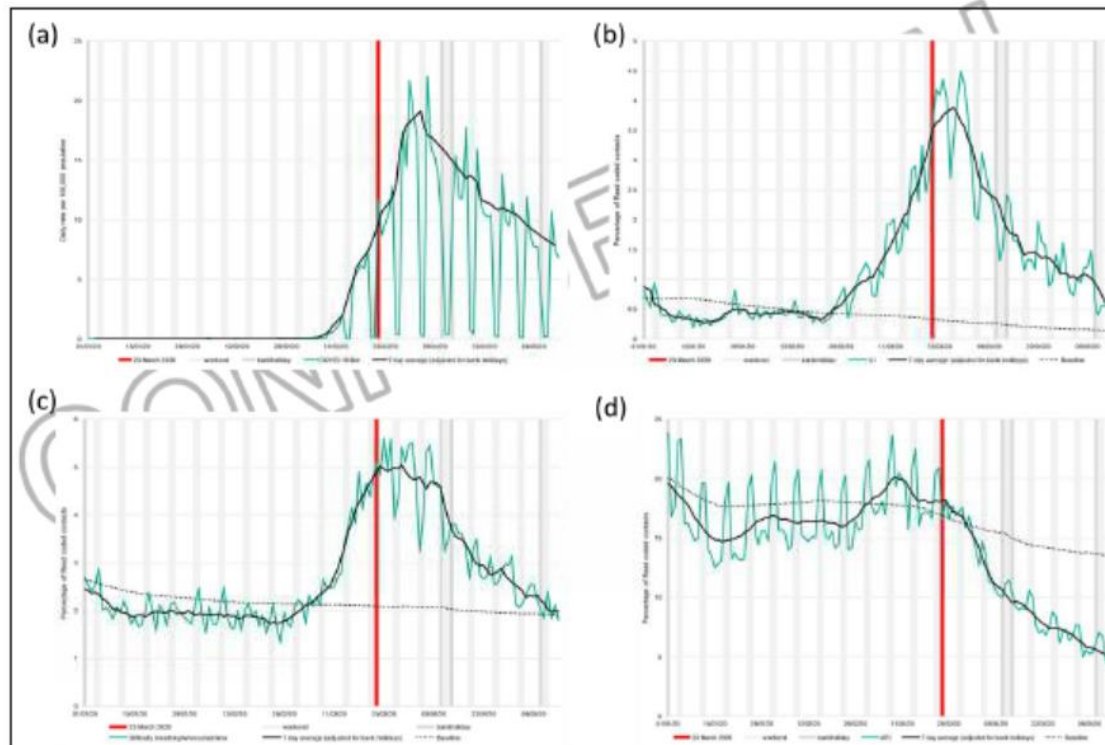
Syndromic Surveillance

Figure 3: (a) COVID-19 GP diagnosis code indicator per 100,000 population (includes consultations using new codes for suspected, tested, exposed and confirmed COVID-19); (b) GP out of hours, daily contacts, as a percentage of the total contacts with a diagnosis code for influenza-like Illness (ILI) (c) GP out of hours, daily contacts, as a percentage of the total contacts with a diagnosis code for difficulty breathing/wheeze/asthma (d) GP out of hours, daily contacts, as a percentage of the total contacts with a diagnosis code for acute Respiratory Infection (ARI), (and 7-day moving averages). Red vertical lines indicate introduction of mandatory SPDM.
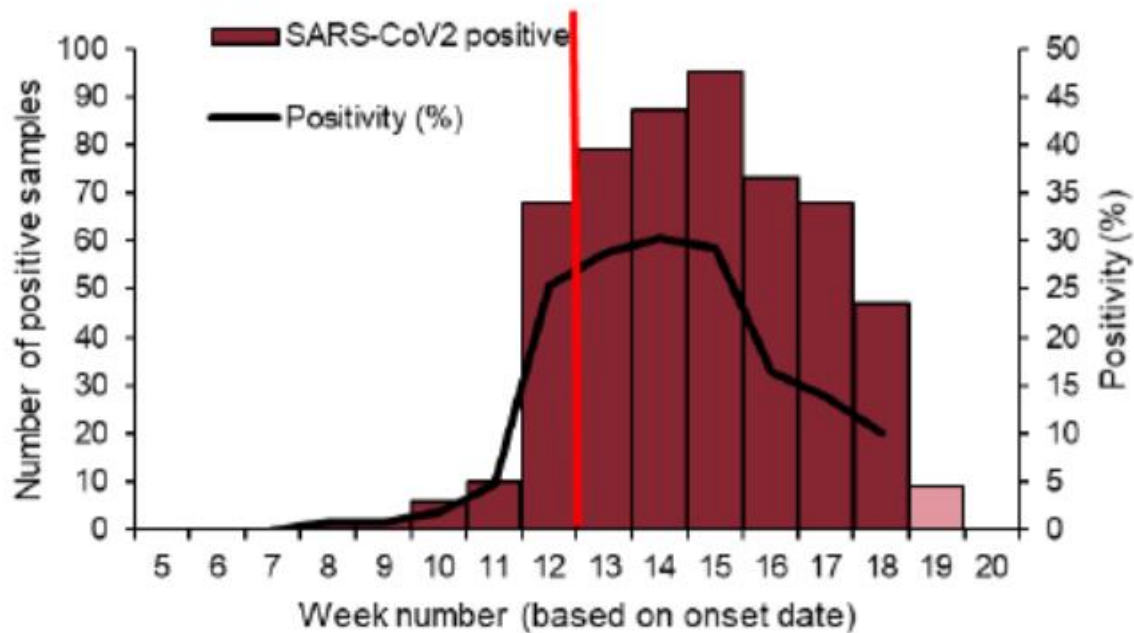
Primary care swabbing

Figure 4: Overall positivity (%) of GP sentinel swabs (weekly) and number of SARS-CoV-2 positive samples. Red vertical line indicates introduction of mandatory SPDM.
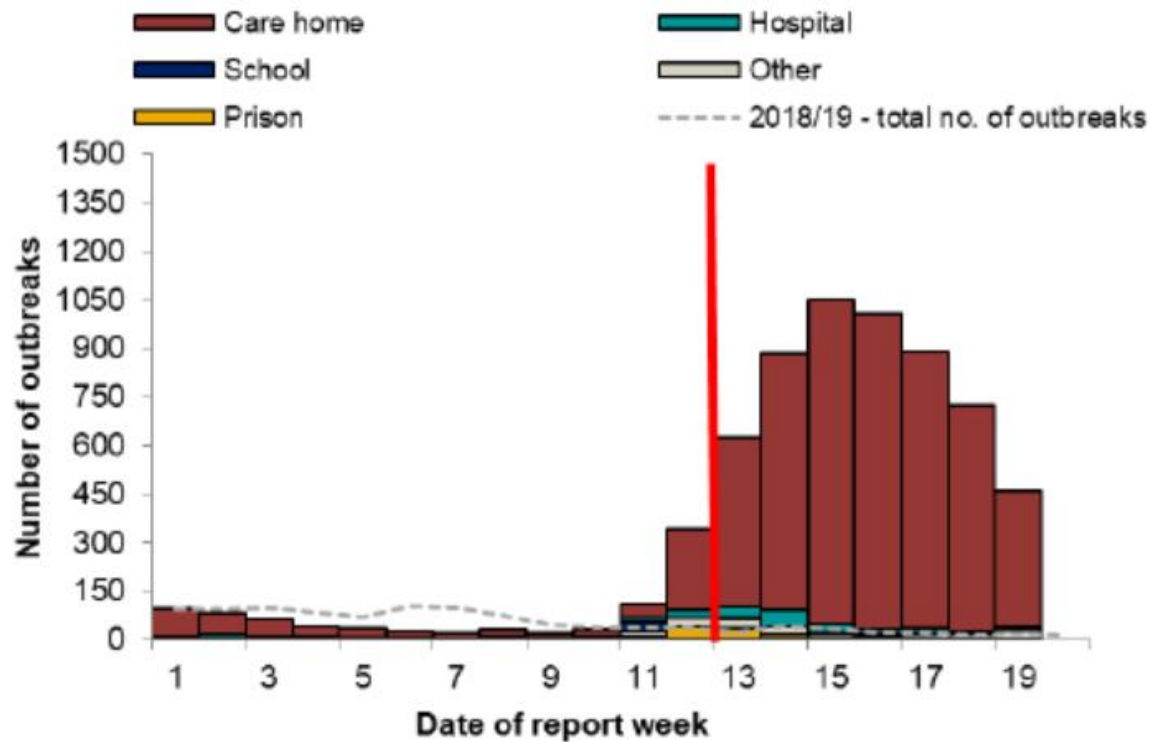
Outbreaks

Figure 5: Number of acute respiratory outbreaks by institution. Red vertical line indicates introduction of mandatory SPDM.
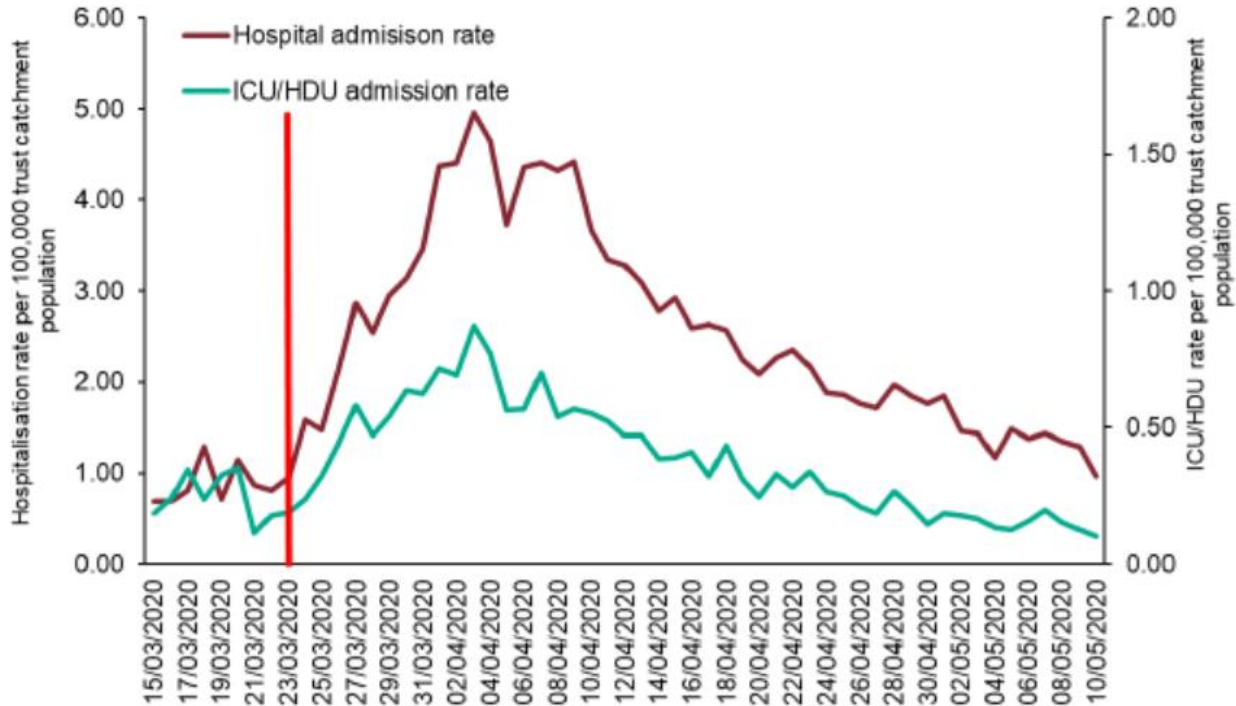
Secondary Care

Figure 6: Daily hospital admission rate and critical care (ICU/HDU) admission rate. Red vertical line indicates introduction of mandatory SPDM.
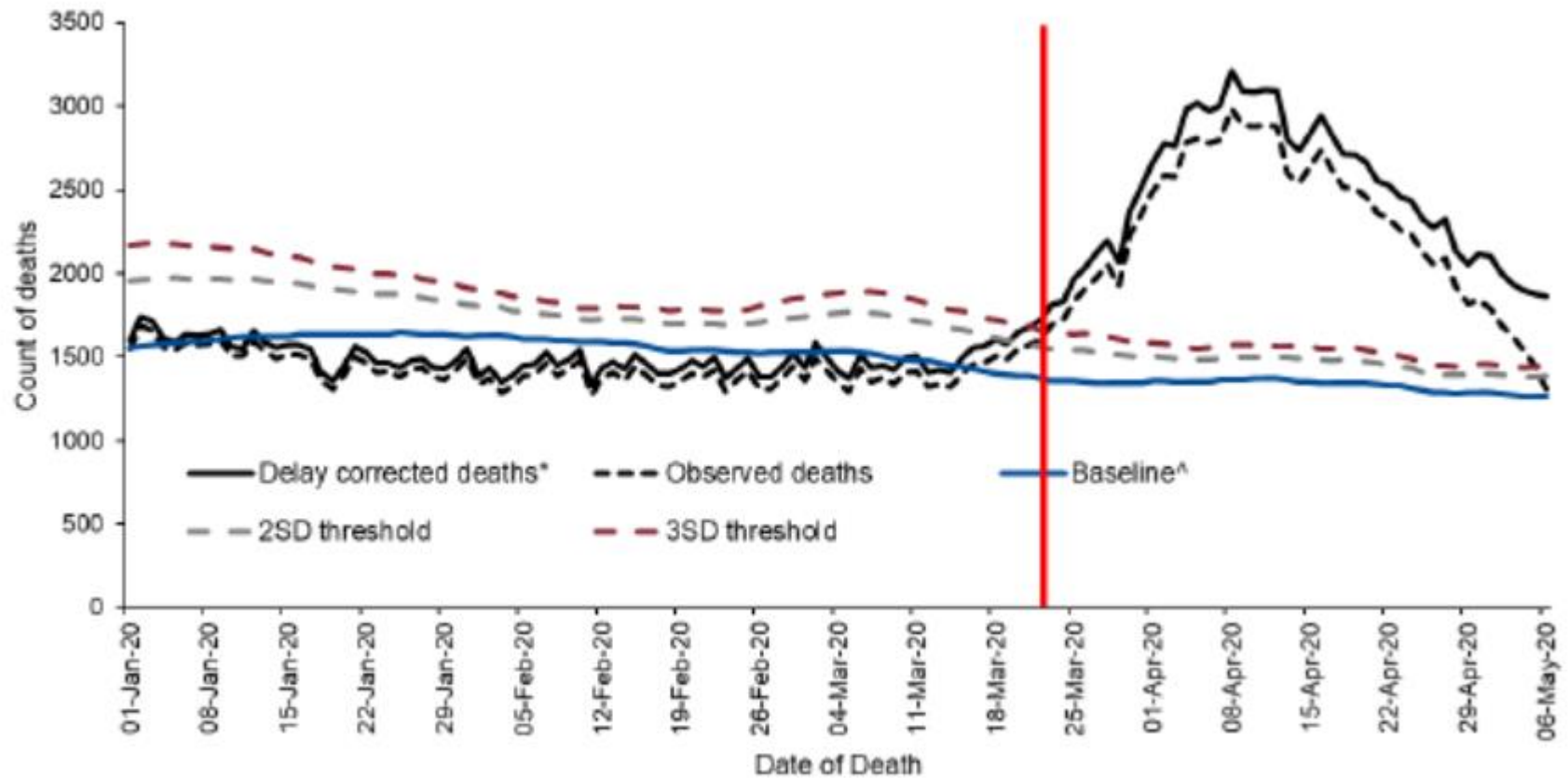
All cause mortality

Table 1: Time from the introduction of mandatory SPDM to date of first detectable impact in each surveillance system

Surveillance system	Indicator	Frequency	Date of first detectable impact	Week of first detectable impact	Time to first detectable impact
Population symptom survey	Self-reported fever or cough	Weekly	-	Week 13	<1 week
Symptom web searches	Searches for COVID-19 symptoms	Daily	28th March	Week 13	5 days
Syndromic	GP in hours COVID-19 indicator[1]	Daily	4th April	Week 14	12 days
	GP out of hours ILI consultations	Daily	30th March	Week 14	7 days
	GP out of hours difficulty breathing consultations	Daily	25th March	Week 13	2 days
	GP out of hours ARI consultations	Daily	10th March	Week 11	-12 days
	ED COVID-19 indicator[2]	Daily	6th April	Week 15	14 days
	ED ARI attendances	Daily	5th April	Week 14	13 days
Primary care virology	GP sentinel swab positivity	Weekly	-	Week 13	<1 week

|					
Outbreaks	Acute respiratory infection outbreaks	Weekly	-	Week 16	4 weeks
Secondary care	Hospital admissions	Daily	4th April	Week 14	12 days
	Critical care admissions	Daily	4th April	Week 14	12 days
	Laboratory positivity rates	Daily	6th April	Week 15	14 days
Mortality	Deaths among confirmed cases	Daily	9th April	Week 15	17 days
	Excess all-cause mortality	Daily	9th April	Week 15	17 days

1..Indicator includes consultations using new codes for suspected, tested, exposed and confirmed COVID-19. 2. with a COVID-19 related primary diagnosis code

Discussion

- Clear impact of measures in surveillance systems
- Delay in line with expected intervals between measure and outcome
- Voluntary measures ahead of mandatory
- Influence surveillance systems adapted – but also difficult to interpret
- Community surveillance important early indicator for changes
- Next to case-based surveillance, syndromic surveillance population surveys and community testing necessary (consistent, uninterrupted)

Timeline of events in Germany
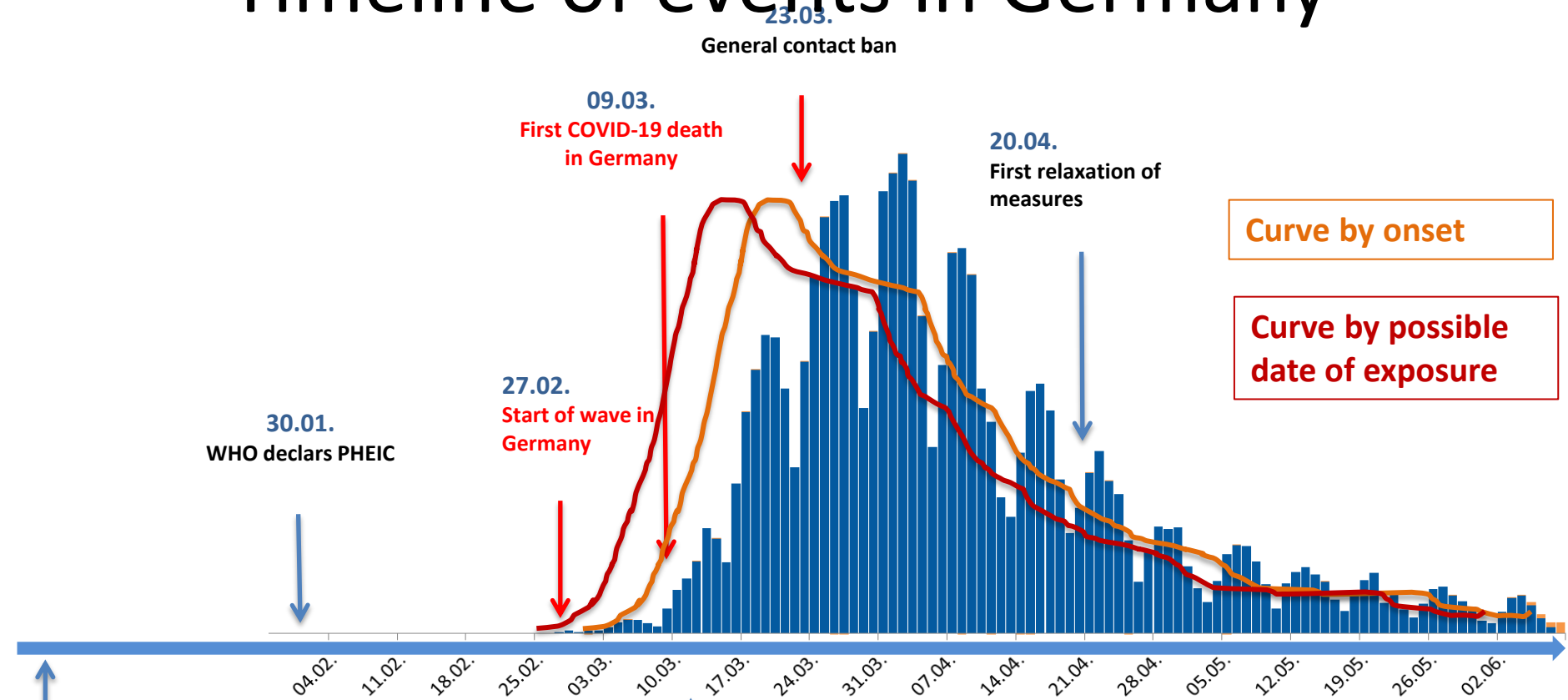
Germany COVID-19 preparedness a...

Erfassung der SARS-CoV-2 Testungen in Deutschland
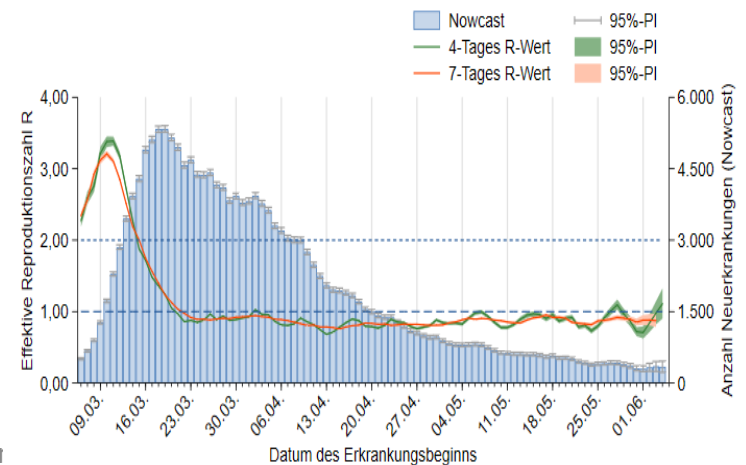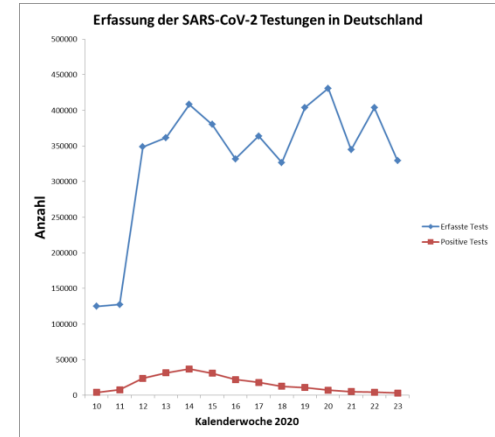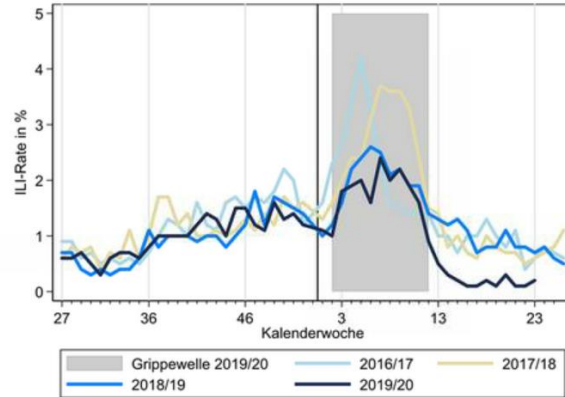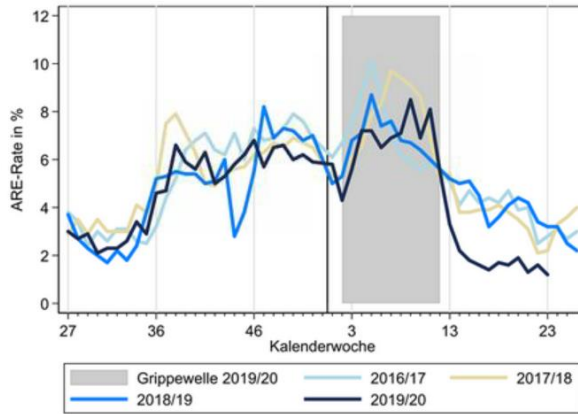
Wöchentliche Sterbefallzahlen in Deutschland
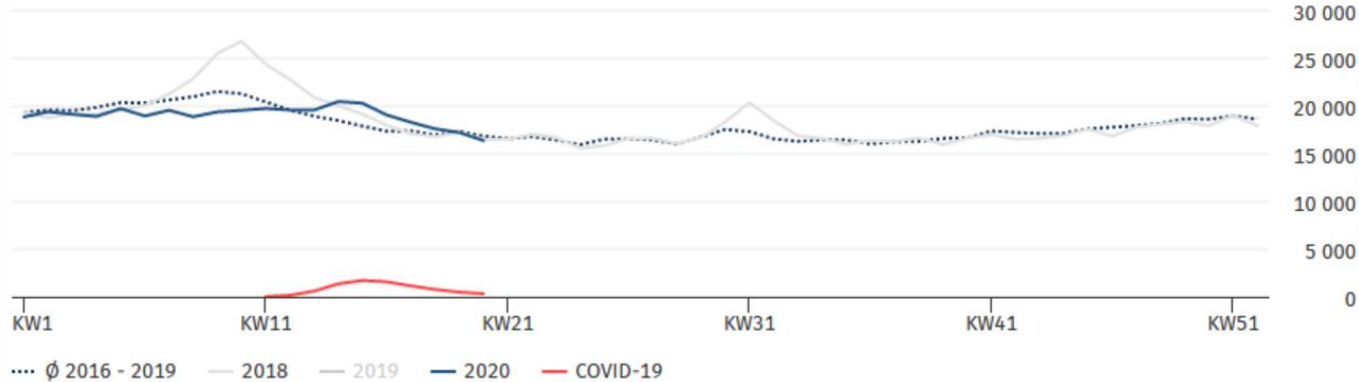
Das Anklicken oder Antippen der Legende blendet Merkmale aus und ein.
Quellen: Sterbefallzahlen insgesamt: Statistisches Bundesamt, COVID-19-Todesfälle: Robert Koch-Institut