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KEEP THE CHILDREN SAFE AT HOME, BUT WISELY!

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KEEP THE CHILDREN SAFE AT HOME, BUT WISELY!

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KEEP THE CHILDREN SAFE AT HOME, BUT WISELY!

"What is important is seldom urgent and what is urgent is seldom important".

Looking at the burden of accesses (Figure 1) to one of the biggest pediatric Emergency Department (ED) in northern Italy, during the COVID-19 pandemic emergency, many considerations arise, but certainly, some pediatricians will have come up with this famous aphorism of President Dwight D. Eisenhower. At the same time, this picture gives insight into the utilization rates of a pediatric ED during a time when there is an additional perceived risk in using ED services.

The Emilia Romagna (ER) region as well as Lombardy, in northern Italy, in March 2020 has been one of the largest and most serious clusters of COVID-19 in the world. In Italy, despite aggressive containment efforts and strict social limitations (Figure 1), the disease continues to spread and the number of affected patients is rising. As of April 14, the numbers of confirmed contagious and deaths related to COVID-19 are 162.488 and 21.067 respectively in Italy, and 20.752 and 2.705 in ER.[1]

Concomitantly with this exploding outbreak, hospital official statistics in the period January 30-April 14, 2020, show a dramatic decrease of ED visits at the largest pediatric center of ER, the S.Orsola University Hospital of Bologna, compared with the same period of 2019. The total number of accesses of this period in 2020 is 3086 that, if compared to the 5475 of the same period of 2019 means a decrease of 44% (Figure 1).

On the other hand, we observed an increase in the admission rate from 5.2% of 2019 to 12.7% of 2020. The rate of medium to highly urgent color-coded triage tags also increased from 58.2%, 4,5% and 0.5% of green, yellow and red codes respectively to 67.3%, 8,5% and 0.8%.

Some hypotheses that could possibly explain this phenomenon and potential downstream effects are here reported.

One explanation of the decrease on utilization of the pediatric ED could be related to the several social limitations imposed by Italian ministerial ordinances, which are reported in the chronicle of Fig 1. Schools and kindergartens have been closed since February 23 and it was strictly recommended

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to the parents, in case of flu symptoms or illness of the children, to call the regional information hotline and not to cram the ED. We could speculate that the social limitations imposed by the government for reacting to the COVID-19 outbreak determined as a sort of "selection" on the burden of non-urgent accesses to the pediatric ED.

It is well documented that the high level of utilization of pediatric ED services is overwhelmed by inappropriate and heavy access for non-urgent conditions.[2]

The percentage of access to pediatric ED for non-urgent reasons mainly ranges from 24% to 40% of total accesses, with peaks up to 90%.[2] A significant reduction of pediatric ED visits and a concomitant increase in the proportion of children admitted was also observed in 2003 during the SARS outbreak in some "hot zone" as the Greater Toronto Area.[3]

This is not necessarily a breakdown in the system because may mean that an ED actually functions for the purpose for which it was intended, for emergencies.

The second point is the role that restricted environmental exposures may play dampening epidemic 'waves' due to non-COVID-19 most represented seasonal affections, namely influenza-associated respiratory infections, respiratory syncytial virus-related bronchiolitis, and acute gastroenteritis. Being schools closed and other forms of social aggregations forbidden, the impact of highly contagious viral affections could have been seriously limited among children, especially the younger ones. It was already reported that closing schools have dramatic effects on the transmission of pandemic influenza.[4]

Third, it seems that children are less likely to become severely ill than older adults by COVID-19 infection.[5] Among symptomatic children, 5% had dyspnea or hypoxemia (a substantially lower percentage than what has been reported for adults) and 0.6% progressed to acute respiratory distress syndrome and/or multiorgan system dysfunction. [5]

This said, we also would consider and highlight that is conceivable that a psychological attitude of reticence and fear towards hospital environments has become widespread, leading to neglecting clinical conditions that deserve an urgent medical evaluation. One of the most worrying implications

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of this perception is the risk of a delayed access to hospital care for children with special needs and for those with acute onset of chronic conditions.

Just to report some emblematic situations we faced during the above-mentioned period of 2020: we admitted three painful vasocclusive crises in sickle cell disease-children who needed hospitalization and can be hypothesized to be unsuccessfully treated at home too long before being evaluated. Two children presented to the ED with acute onset type 1 diabetes and ketoacidosis and parents reported that polyuria and polydipsia were raised more than one week before. A sepsis was diagnosed in a young child resulting from an untreated urinary tract infection. An urgent cerebrospinal fluid shunt placement was performed in a child whose parents reported the onset of cerebellar dysmetria three weeks before but preferred to send a video to their family pediatrician instead of going to the hospital fearing the COVID-19 pandemic.

The fine balance between the limitation of non-urgent access and the selection of serious cases is a responsibility that cannot be completely delegated to the parents/families in this emergency period. To prevent delays in accessing hospital care and to promote a high quality coordinated care by health-care providers we set up a task force with family paediatricians and general practitioners aimed at monitoring children with special needs (eg, patients with high therapeutic burden as the one suffering from cancer or epileptic encephalopathy, severe syndromic illnesses and chronic endocrine/metabolic disorders). Parents of these children are strongly encouraged to call the dedicated phone numbers of their family paediatricians and these latter can agree on hospital access with the specialists. Other strategies to address this novel and unexpected scenario should be strongly encouraged.

Taking into account all the possible heterogeneous variables related to the dramatic decrease in the number of ED pediatric visits that we are observing during this COVID-19 times, we would firmly draw the attention of the pediatric community on the risk of neglecting the important needs of sub-populations of children with an increased risk for more other significant illnesses. These children take the risk of being seriously penalized by the fear generated by the COVID-19 pandemic. This aspect

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should be considered as an important impact of the pandemic on the overall public health and must be adequately monitored.

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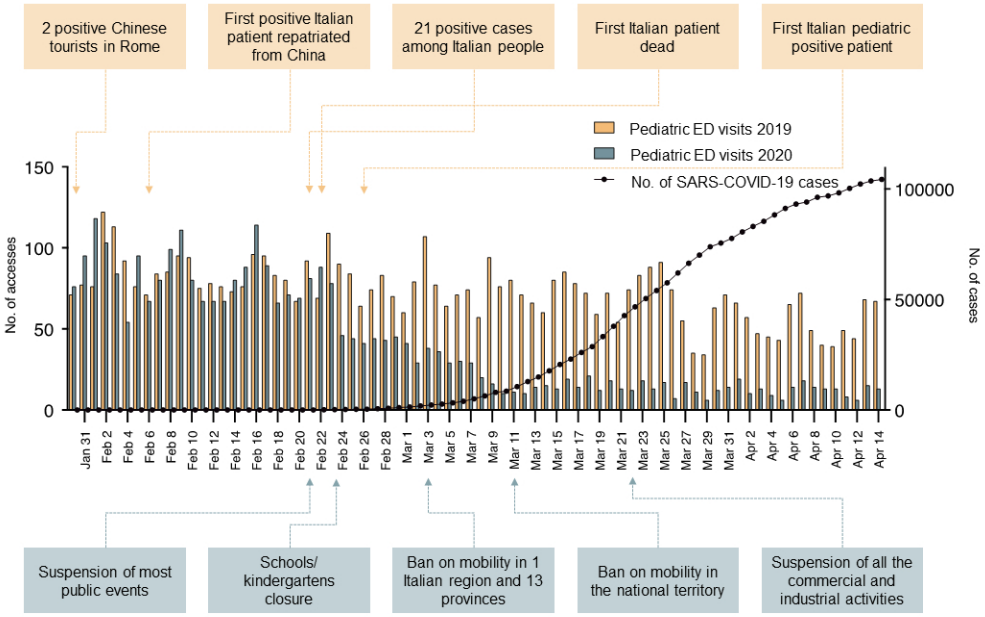

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Presentations to the Emergency Department in Bologna, Italy during COVID-19 outbreak

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Presentations to the Emergency Department in Bologna, Italy during COVID-19 outbreak

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Contributorship: Riccardo Masetti collected data and drafted the initial manuscript. Ilaria Corsini and Davide Leardini collected data. Marcello Lanari and Andrea Pession conceptualized the study and critically reviewed the manuscript for important intellectual content. All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.
Patient involvement: Patients were not directly involved in the design of this study.

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ABSTRACT

The Emilia Romagna (ER) region, Italy, in March 2020 has been one of the largest and most serious clusters of COVID-19 in the world. In the period January 30-May 31, 2020, the number of pediatric ED presentations in Bologna, ER, decreased by 50% compared to the same period of 2019. Visits declined for every age group, being the decrease of 35%, 55% and 46% for the three age groups 0-2, 2-10 and 10-14 years, respectively. The admission rate increased from 5% to 13%. We here analyze the possible explanations and consequences of this phenomenon.

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Presentations to the Emergency Department in Bologna, Italy during COVID-19 outbreak

The Emilia Romagna (ER) region, in northern Italy, in March 2020 has been one of the largest and most serious clusters of COVID-19 in the world. In Italy, despite aggressive containment efforts and strict social limitations (figure 1), the disease has continued to spread until the second week of April 2020 when the number of affected patients reached 108.257. As of May 31, the numbers of confirmed contagious and deaths related to COVID-19 are 233.019 and 33.415 respectively in Italy, and 27.790 and 4.114 in ER.[1]

Concomitantly with this exploding outbreak, hospital official statistics in the period January 30-May 31, 2020, showed a dramatic decrease in emergency department (ED) visits at the largest pediatric center of ER, the S.Orsola University Hospital of Bologna, compared with the same period of 2019. The total number of accesses in this period in 2020 is 3901 that, if compared to the 7748 of the same period of 2019 means a 50% decrease (figure 1). The lowest number of ED visits occurred during the period from March 10 to April 15 (512 and 2324 in 2020 and 2019, respectively, for a decrease of 78%). Emergency visits declined for every age group, being the decrease of 35%, 55% and 46% for the three age groups 0-2, 2-10 10-14 years respectively. We conversely observed an increase in the admission rate from 5% of 2019 to 13% of 2020. The rate of medium to highly urgent color-coded triage tags also increased from 58%, 4% and 0.01% of green, yellow and red codes respectively, to 70%, 7% and 0.02%. After the end of the "lockdown" phase (March 10-May 3) and the reopening of the commercial and social activities, it has not been registered yet a sensible increase in the number of accesses, with a median number of 13 visits per day pre-"lockdown" increased to 18 visits per day post-"lockdown".

Some hypotheses possibly explaining the effects on utilization of the pediatric ED are here reported. The first could be concerning the several social limitations imposed by Italian ministerial ordinances. During the "lockdown", it was strictly recommended to the parents, in case of flu symptoms or illness of the children, to call the regional information hotline and not to cram the ED. We could speculate

that this determined as a sort of "selection" on the burden of non-urgent accesses to the pediatric ED. It is well documented how the high level of utilization of pediatric ED services is overwhelmed by inappropriate and heavy access for non-urgent conditions, being the percentage of access for non-urgent reasons ranging from 24% to 40% of total accesses, with peaks up to 90%.[2]

The second point is the role that restricted environmental exposures may play dampening epidemic 'waves' due to non-COVID-19 most represented seasonal affections, namely influenza-associated respiratory infections, respiratory syncytial virus-related bronchiolitis, and acute gastroenteritis. The effects of closing schools during COVID-19 pandemic, on the transmission of viral infections, was recently reported.[3]

Third, it seems that children are less likely to become severely ill than older adults by COVID-19 infection. Among symptomatic children, 5% had dyspnea or hypoxemia and 0.6% only progressed to acute respiratory distress syndrome and/or multiorgan system dysfunction. [4]

It is also conceivable that a psychological attitude of reticence and fear towards hospital environments has become widespread, leading to neglecting clinical conditions that deserve an urgent medical evaluation.[5]

The striking decline in pediatric ED visits during COVID-19 outbreak is an evolving scenario. The COVID-19 "lesson" could give us the opportunity for rethinking our pediatric ED organization.

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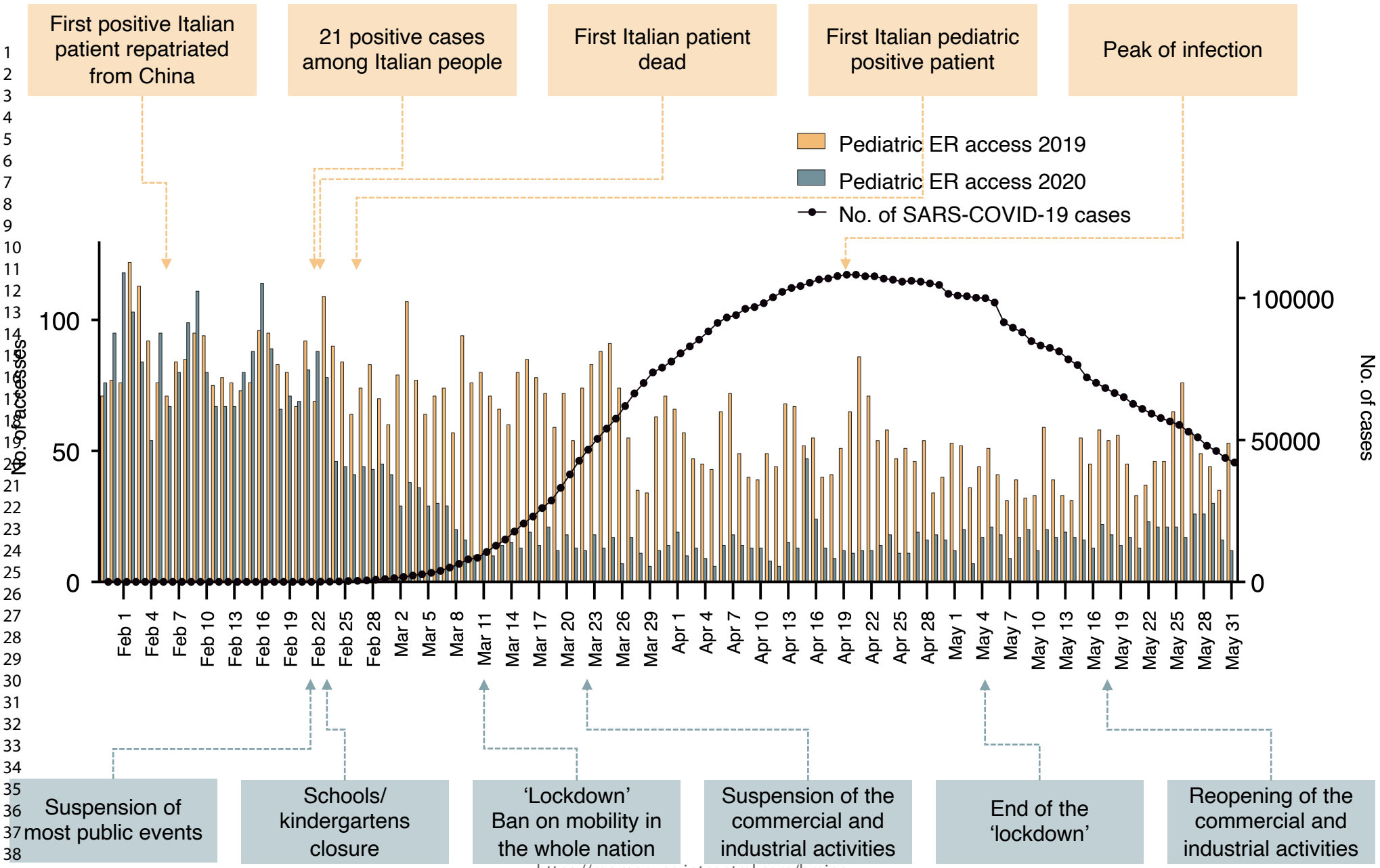
First positive Italian patient repatriated from China
21 positive cases among Italian people
First Italian patient dead
First Italian pediatric positive patient
Peak of infection
Pediatric ER access 2019
Pediatric ER access 2020
No. of SARS-COVID-19 cases
No. of accesses
No. of cases
0
50
100
0
50000
100000
Feb 1
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May 31
Suspension of most public events
Schools/ kindergartens closure
'Lockdown' Ban on mobility in the whole nation
Suspension of the commercial and industrial activities
End of the 'lockdown'
Reopening of the commercial and industrial activities

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Presentations to the Emergency Department in Bologna, Italy during COVID-19 outbreak

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Contributorship: Riccardo Masetti collected data and drafted the initial manuscript. Ilaria Corsini and Davide Leardini collected data. Marcello Lanari and Andrea Pession conceptualized the study and critically reviewed the manuscript for important intellectual content. All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.
Patient involvement: Patients were not directly involved in the design of this study.

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ABSTRACT

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Some hypotheses possibly explaining the effects on utilization of the pediatric ED are here reported. The first could be concerning the several social limitations imposed by Italian ministerial ordinances. During the "lockdown", it was strictly recommended to the parents, in case of flu symptoms or illness of the children, to call the regional information hotline and not to cram the ED. The health system in Italy provides for each resident child a family pediatrician until the age of 14. Patients can refer to their family pediatricians during the work hours of the weekday. In case of emergency, patients can refer to the ED autonomously, or after the consult with the family pediatrician, on any day or night of the week including the weekend. Access to the ER is always free of charge for children younger than 14 years.

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We could speculate that the pandemic, determined as a sort of "selection" on the burden of non-urgent accesses to the pediatric ED. It is well documented how the high level of utilization of pediatric ED services is overwhelmed by inappropriate and heavy access for non-urgent conditions, being the percentage of access for non- urgent reasons ranging from 24% to 40% of total accesses, with peaks up to 90%.[2]

The second point is the role that restricted environmental exposures may play dampening epidemic 'waves' due to non-COVID-19 most represented seasonal affections, namely influenza-associated respiratory infections, respiratory syncytial virus-related bronchiolitis, and acute gastroenteritis. The effects of closing schools during COVID-19 pandemic, on the transmission of viral infections, was recently reported.[3] Consistently with what reported in Figure 1, we could hypothesize that an immediate drop in accesses from February 24 could be more likely related to the ministerial ordinances while the subsequent decrease could be attributed to a lower incidence of seasonal affections.

Third, it seems that children are less likely to become severely ill than older adults by COVID-19 infection. Among symptomatic children, 5% had dyspnea or hypoxemia and 0.6% only progressed to acute respiratory distress syndrome and/or multiorgan system dysfunction.[4]

It is also conceivable that a psychological attitude of reticence and fear towards hospital environments has become widespread, leading to neglecting clinical conditions that deserve an urgent medical evaluation.[5] A possible implication of this perception is the risk of a delayed access to hospital care for children with special needs and for those with acute onset of chronic conditions.

The striking decline in pediatric ED visits during COVID-19 outbreak is an evolving scenario. The COVID-19 "lesson" could give us the opportunity for rethinking our pediatric ED organization.

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FIGURE LEGEND

Figure 1: Visits to the pediatric emergency department of Bologna, northern Italy, 30 January-31 May 2020, compared with the same period in 2019 and chronicle of events in Italy during the COVID-19 pandemic.

Figure 2: Trend of highly urgent color-coded triage tags by week in pediatric emergency department of Bologna, northern Italy from 30 January-31 May 2020. Green and yellow lines represent the ratio: yellow codes/green + white codes in 2020 and 2019, respectively.

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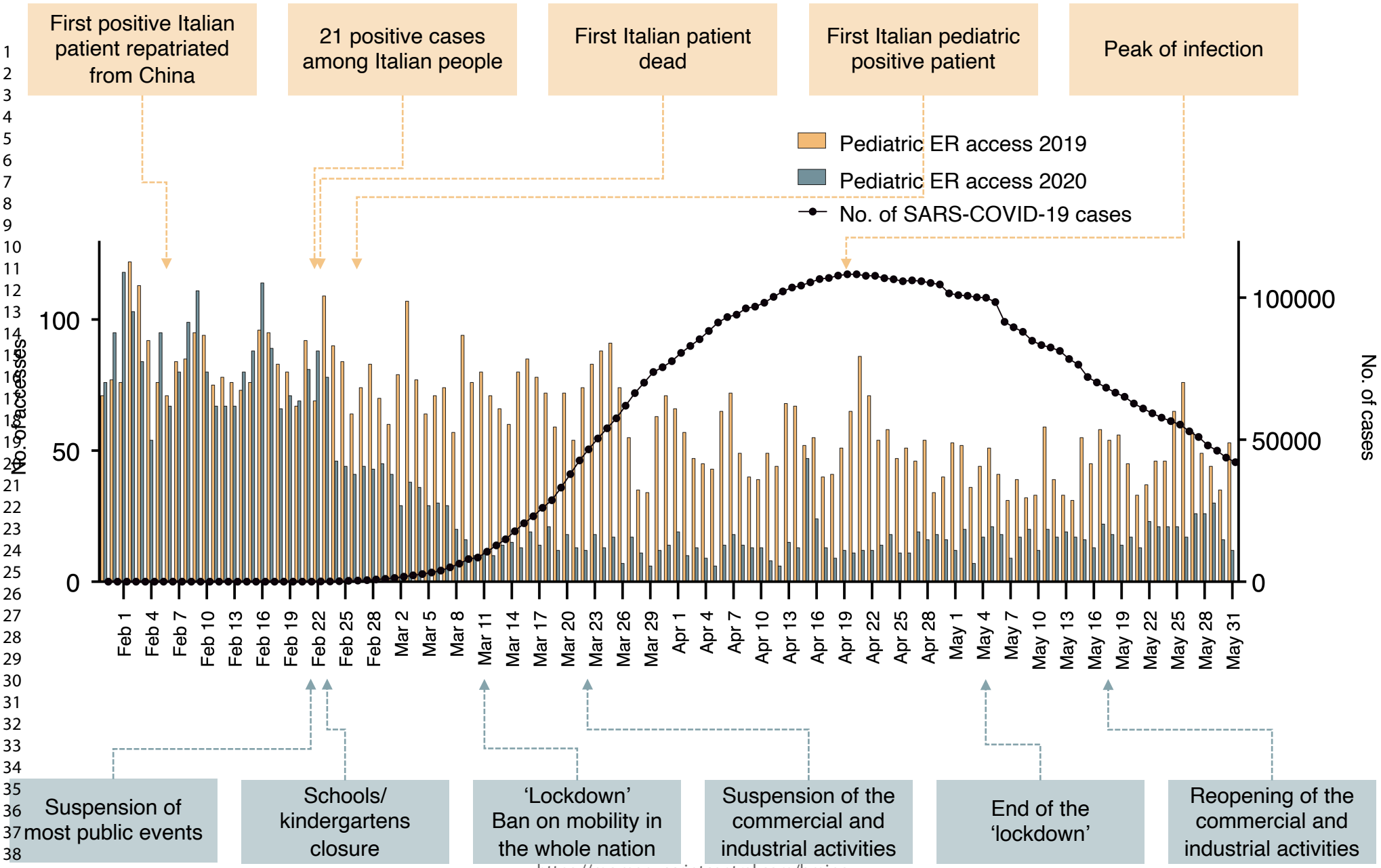
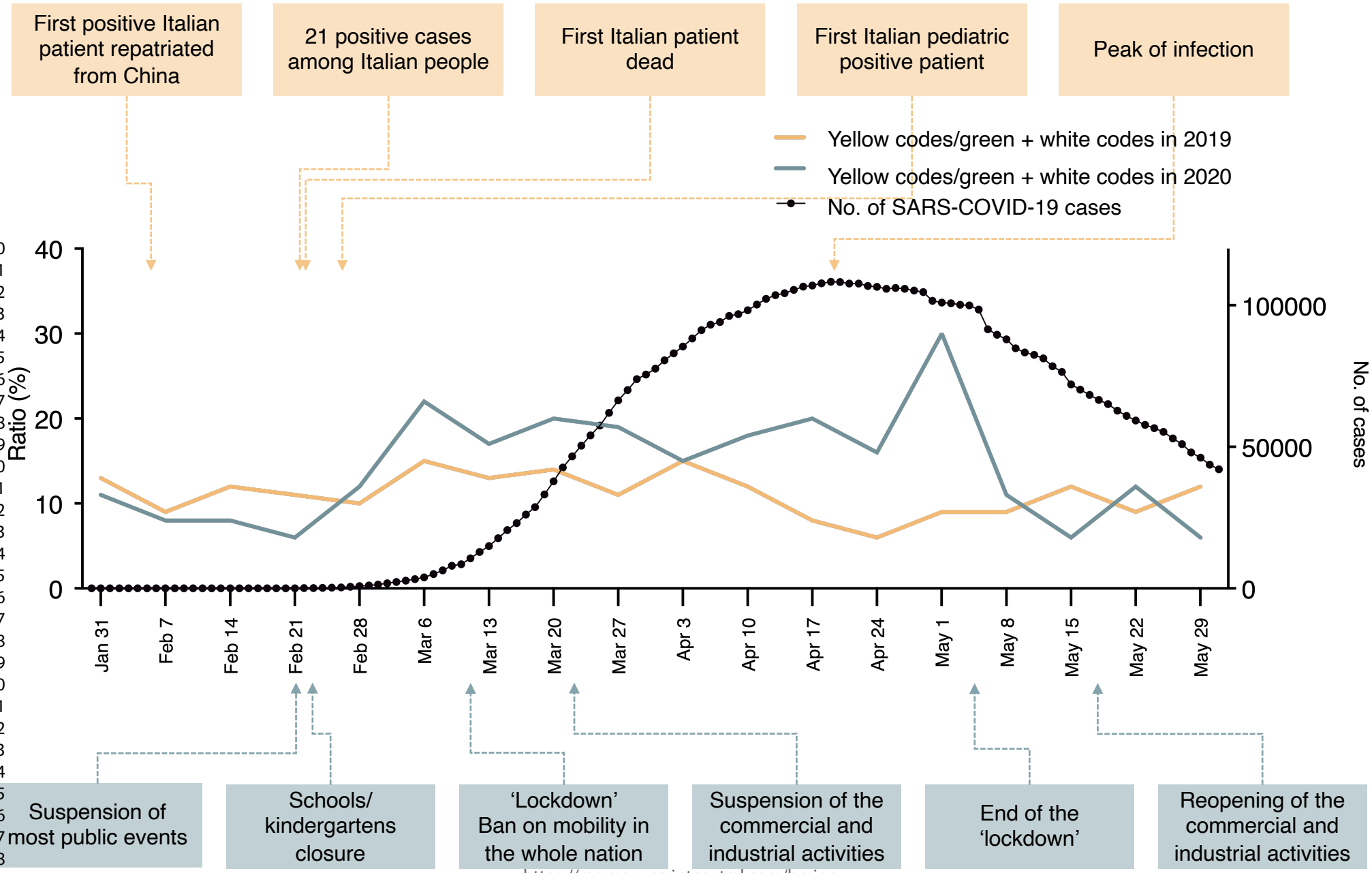

First positive Italian patient repatriated from China
21 positive cases among Italian people
First Italian patient dead
First Italian pediatric positive patient
Peak of infection
Pediatric ER access 2019
Pediatric ER access 2020
No. of SARS-COVID-19 cases
No. of accesses
No. of cases
0
50
100
0
50000
100000
Feb 1
Feb 4
Feb 7
Feb 10
Feb 13
Feb 16
Feb 19
Feb 22
Feb 25
Feb 28
Mar 2
Mar 5
Mar 8
Mar 11
Mar 14
Mar 17
Mar 20
Mar 23
Mar 26
Mar 29
Apr 1
Apr 4
Apr 7
Apr 10
Apr 13
Apr 16
Apr 19
Apr 22
Apr 25
Apr 28
May 1
May 4
May 7
May 10
May 13
May 16
May 19
May 22
May 25
May 28
May 31
Suspension of most public events
Schools/ kindergartens closure
'Lockdown' Ban on mobility in the whole nation
Suspension of the commercial and industrial activities
End of the 'lockdown'
Reopening of the commercial and industrial activities


First positive Italian patient repatriated from China
21 positive cases among Italian people
First Italian patient dead
First Italian pediatric positive patient
Peak of infection
Yellow codes/green + white codes in 2019
Yellow codes/green + white codes in 2020
No. of SARS-COVID-19 cases
Ratio (%)
No. of cases
0
10
20
30
40
0
50000
100000
Jan 31
Feb 7
Feb 14
Feb 21
Feb 28
Mar 6
Mar 13
Mar 20
Mar 27
Apr 3
Apr 10
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Apr 24
May 1
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Presentations to the Emergency Department in Bologna, Italy during COVID-19 outbreak

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Contributorship: Riccardo Masetti collected data and drafted the initial manuscript. Ilaria Corsini and Davide Leardini collected data. Marcello Lanari and Andrea Pession conceptualized the study and critically reviewed the manuscript for important intellectual content. All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.
Patient involvement: Patients were not directly involved in the design of this study.

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ABSTRACT

The Emilia Romagna (ER) region, Italy, in March 2020 has seen one of the largest and most serious clusters of COVID-19 in the world. In the period January 30-May 31, 2020, the number of pediatric ED presentations in Bologna, ER, decreased by 50% compared to the same period of 2019. Visits declined for every age group, with a decrease of 35%, 55% and 46% for the three age groups 0-2, 2-10 and 10-14 years, respectively. The admission rate increased from 5% to 13%. Fewer non-urgent attendances, alongside a decrease in seasonal infections due to the lockdown appear to be the main reasons .

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Presentations to the Emergency Department in Bologna, Italy during COVID-19 outbreak

The Emilia Romagna (ER) region, in northern Italy, in March 2020 has seen one of the largest and most serious clusters of COVID-19 in the world. In Italy, despite aggressive containment efforts and strict social limitations (figure 1), the disease has continued to spread until the second week of April 2020 when the number of affected patients reached 108,257. As of May 31, the numbers of confirmed cases and deaths related to COVID-19 are 233,019 and 33,415 respectively in Italy, and 27,790 and 4114 in ER. [1]

Concomitantly with this exploding outbreak, hospital official statistics in the period January 30-May 31, 2020, showed a dramatic decrease in emergency department (ED) visits at the largest pediatric center of ER, the S.Orsola University Hospital of Bologna, compared with the same period of 2019. The total number of attendances in this period in 2020 is 3901 , compared to 7748 in the same period of 2019 (50% decrease)(figure 1). The lowest number of ED visits occurred during the period from March 10 to April 15 (512 and 2324 in 2020 and 2019, respectively, a decrease of 78%). Emergency visits declined for every age group, with a decrease of 35%, 55% and 46% for the three age groups 0-2, 2-10 10-14 years respectively. We conversely observed an increase in the admission rate from 5% of 2019 to 13% of 2020. The rate of medium (green & yellow) to highly urgent(red) color-coded triage tags also increased from 58%, 11% and 0.01% of green, yellow and red codes respectively, to 70%, 14% and 0.02%. The weekly rate of urgent color-coded on the total access in 2020 increased in the period from February 28 to May 8, presenting a spike between May 1 and May 8 (figure 2). After the end of the "lockdown" phase (March 10-May 3) and the reopening of the commercial and social activities, attendances remain lower in 2020 than 2019 (figure 1).

Some hypotheses possibly explaining the effects on utilization of the pediatric ED are discussed. The first could be concerning the several social limitations imposed by Italian ministerial ordinances. During the "lockdown", it was strictly recommended to the parents, in case of flu symptoms or illness of the children, to call the regional information hotline and not to visit the ED. The health system in Italy provides for each resident child a family pediatrician until the age of 14. Patients can refer to their family pediatricians during the work hours of the weekday. In case of emergency, patients can refer to the ED autonomously, or after consulting with the family pediatrician, on any day or night of the week including the weekend. Access to the ER is always free of charge for children younger than 14 years.

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We speculate that the pandemic, reduced non-urgent attendances to the pediatric ED. It is well documented how the high level of utilization of pediatric ED services is overwhelmed by inappropriate non-urgent conditions, with the percentage of non- urgent cases ranging from 24% to 40% of total attendances, with peaks up to 90%.[2]

The second point is the role that restricted environmental exposures may play in dampening epidemic 'waves' due to non-COVID-19 seasonal infections, namely upper respiratory tract infections, bronchiolitis, and acute gastroenteritis. As of February 23, schools remain closed. The effects of closing schools during COVID-19 pandemic on the transmission of viral infections, was recently reported.[3] We hypothesize that an immediate drop in attendances from February 24 is likely to be related to the ministerial ordinances while the subsequent decrease is attributed to a lower incidence of seasonal infections.

Third, it seems that children are less likely to become severely ill than older adults to COVID-19 infection. Among symptomatic children, 5% had dyspnea or hypoxemia and 0.6% only progressed to acute respiratory distress syndrome and/or multiorgan system dysfunction.[4]

It is also conceivable that a psychological attitude of reticence and fear towards hospital environments has become widespread, leading to neglecting clinical conditions that deserve an urgent medical evaluation.[5] A possible risk is delayed access to hospital care for children with special needs and for those with exacerbations of chronic conditions.

The striking decline in pediatric ED visits during COVID-19 outbreak is an evolving scenario. The COVID-19 "lesson" could give us the opportunity for rethinking our pediatric ED organization.

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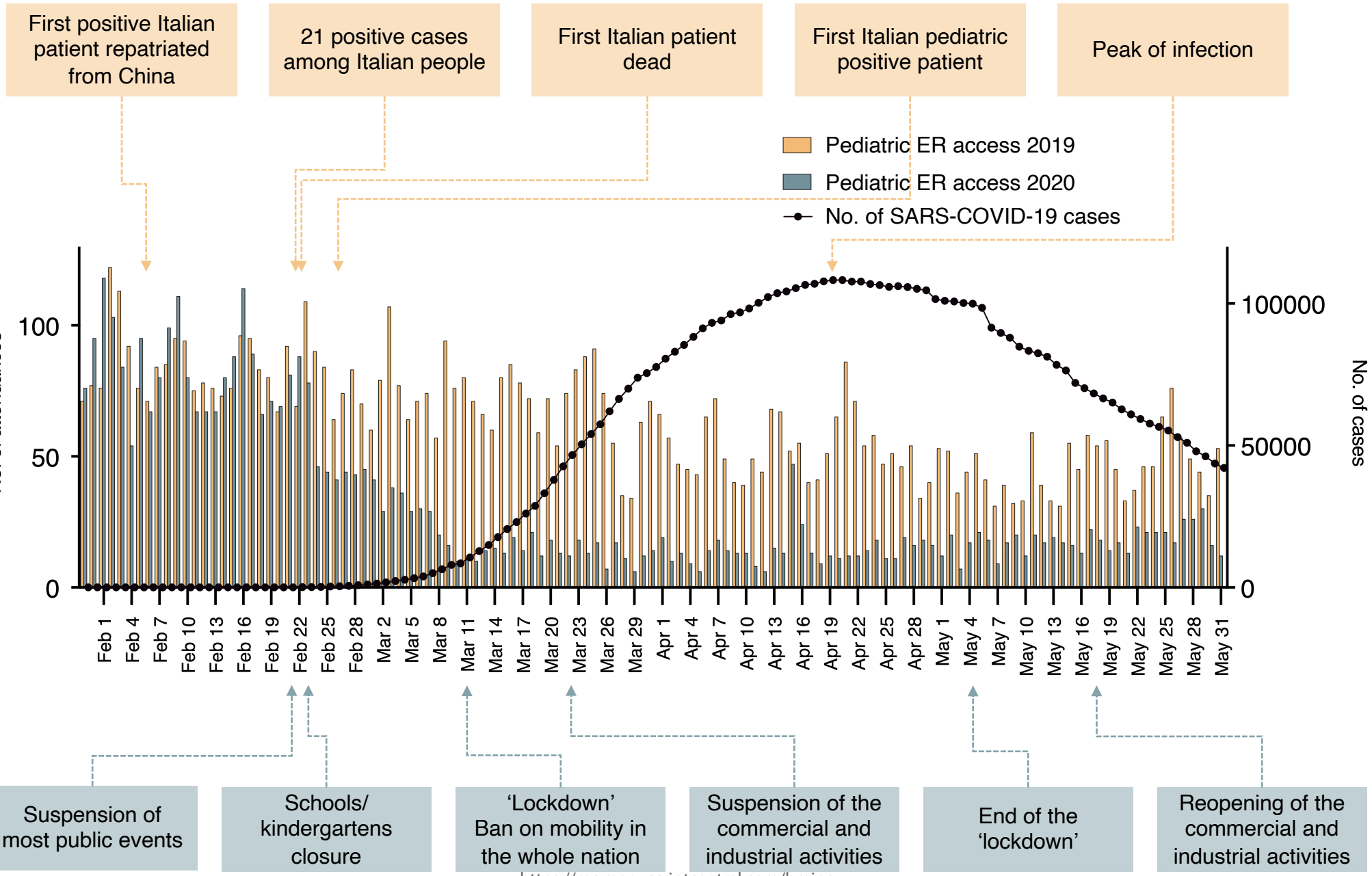
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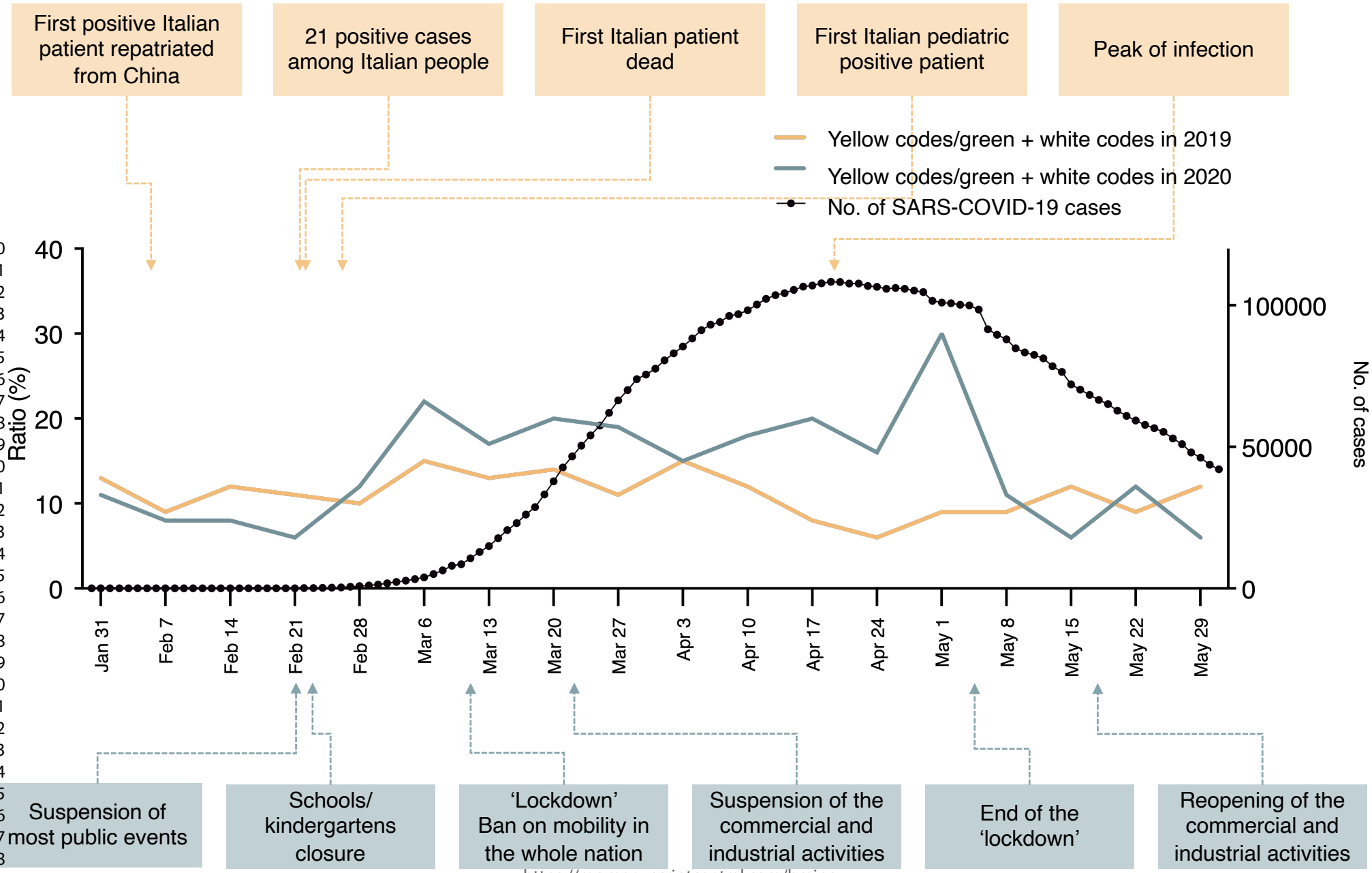
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