

Czech Republic Special Report

Anti-epidemic system makes restrictions more predictable, lockdown may end soon

- **New system is a cleaned-up version of earlier proposal**
- **Criteria are somewhat relaxed from previous version, but not by much**
- **Restrictions are somewhat tightened, though it remains to be seen whether compliance will be**
- **We expect that under updated criteria, lockdown could be lifted at end of current week**
- **We still have doubts how long improvement will last before vaccine arrives**

The health ministry presented a revised version of its anti-epidemic system (PES) last Friday (Nov 13), after holding consultations with various level of government. The new version cleans up a lot of the threshold and the restrictions criteria from the first version published, and the health ministry has begun publishing [a daily risk index](#), depending on which a certain level of restrictions is required. We should note that this system is not officially implemented yet, but judging from what revisions have been applied, we don't expect any more changes. The good news is that under the updated criteria, lockdown could end at the end of this week or early next one in the worst-case scenario.

System description

The system produces a daily risk index, which is calculated through data available up to the previous day. The index can vary between 0 and 100 and there are five restriction thresholds, depending on which various restrictions can be applied. We don't see a material difference between Level 4 and Level 5 restrictions, so we will consider a lockdown as Level 4 restrictions or higher. You can find a detailed table with what restrictions exactly are applied by sector and level, as well as the index score needed to activate each level.

The index itself is calculated through four indicators - new cases per 100,000 over the past 14 days; new cases per 100,000 over the past 14 days for people aged 65 years or older; reproductive number (R); and percentage of unique positive tests over the past 7 days. Each of these carries part of the score (0-20 for the first two indicators, 0-30 for the latter two), which when summed up produces the daily risk index. Here is a more detailed description of the methodology for each indicator:

New cases per 100,000 over past 14 days. The calculation of the criterion is pretty straightforward - the sum of new cases over the past 14 days is divided to the population at end-2019 (10,693,939 people) and then multiplied by 100,000. We have the necessary time series and our calculations match the example provided by the health ministry (you can find time series [here](#));

- **New cases per 100,000 over past 14 days for people aged 65 years or older.** The only difference from the criterion above is that new cases over the past 14 days in that age group are divided to the total people in that age group at end-2019 (2,131,630 people). Unfortunately, data availability is not that good as with total new cases. The health ministry publishes two data series - one includes confirmed cases per age, while [the other](#) includes data sets per age groups (including 65+), but it still provides slightly lower number than those quoted by the health ministry in its example, though the discrepancy is not that big;



- **Reproductive number (R).** The criterion is defined as the ratio between new cases over the past 7 days divided to new cases in a 7-day period that ends 5 days earlier. We are aware that this sounds somewhat complicated, but it is equivalent to the ratio between the 7-day averages of new cases over a period of 5 days (i.e. 7-day avg for t / 7-day avg for t-5). The 5-day period represents the average incubation period for Covid-19. We should note that there are other definitions out there and there is no consensus how exactly to calculate the R indicator, but this is the methodology that the Czech health ministry is using. Our time series match exactly the health ministry's calculation;
- **Percentage of unique positive tests over past 7 days.** The calculation of this criterion is also very straightforward - the number of new cases over the past 7 days is divided to the number of unique tests over the same period. The tricky part here is data for unique tests, which the health ministry doesn't make freely accessible. Currently, there is a note on the health ministry's web site that it can provide time series for unique tests upon request, but we don't see ourselves making daily requests for that data set, especially after the health ministry provides the final result on daily basis. This does mean that our series underestimate the actual percentage of positive tests, which is why we usually get a lower score.

You can find the full methodology (only in Czech), along with examples [here](#). The most accessible presentation is in the first file, the rest explore the methodology in more detail.

After each criterion is calculated, a score is assigned to each, according to a table, which you can find below. Two of the criteria - new cases/100,000 for people aged 65+ and percentage of positive tests - can get 2pts more if they report an increase on weekly basis. The methodology states that once a criterion reaches a threshold, it is automatically considered to be in the higher category. Thus, a range of 1.6-1.9 for the reproductive number means higher or equal to 1.6 and lower than 1.9, for instance.

Criteria score table

New cases per 100,000 over past 14 days								
Level	<10	Oct-25	25-50	50-120	120-240	240-480	480-960	>960
Score	0	2	4	7	10	13	16	20
New cases per 100,000 over past 14 days for people aged 65 years or older								
Level	<10	Oct-25	25-50	50-120	120-240	240-480	480-960	>960
Score	0	2	4	7	10	13	16	20
Reproductive number (R)								
Level	<0.8	0.8-1.0	1.0-1.2	1.2-1.4	1.4-1.6	1.6-1.9	>1.9	
Score	0	5	10	15	20	25	30	
Percentage of unique positive tests over past 7 days								
Level	<3%	3-7%	7-11%	11-15%	15-19%	19-23%	23-26%	>26%
Score	0	3	7	11	15	20	25	30

Source: Czech health ministry

Once all scores are applied, the respective level of restrictions will be activated. These vary a lot among various activities. As we mentioned above, we don't see a lot of difference between Level 4 and Level 5, as the biggest change is that Level 4 restrictions allow a slightly shorter curfew (from 23:00 rather than 21:00), first-graders can go to school, there are slightly higher limits for public gatherings (from 2 to 6 people) and culture events can take place, but still without spectators. However, retailers remain limited to essential goods only, food establishment are limited to takeaway service only, and all kinds of services, recreational sports, spas, swimming pools and wellness centres and the like remain closed. Public administration services are more readily available when compared to Level 5, but still at limited hours.

You can find a complete table with all applied restrictions below, along with the risk index level at which they are applied:

Restriction levels-----

	Level 1	Level 2	Level 3	Level 4	Level 5
<i>Infection risk score</i>	0-20	21-40	41-60	61-75	76-100
Protection of nose and mouth	certain indoor areas and public transport	all indoor areas and public spaces	all indoor areas and selected outdoor public spaces		
Mass events in indoor and outdoor areas	up to 500 people outdoors, 100 indoors	up to 100 people outdoors, 50 people indoors	up to 50 people outdoors, 10 people indoors	up to 6 people	up to 2 people
Weddings, funerals, religions services	up to 100 people	up to 50 people	up to 30 people	up to 20 people	up to 15 people
Visits to healthcare and social facilities	only with face protection	restricted visits to social facilities	no indoor visits to social facilities, restricted visits to healthcare facilities	no visits except extraordinary circumstances	
Freedom of movement	no restrictions			curfew between 23:00 and 5:00	curfew between 21:00 and 5:00
Public and administrative authorities	no restrictions	special regime	limited working hours, special regime		Essential services only, work from home
Accommodation services	no restrictions			Restricted accommodation	
Schools	special regime, distance learning for evening schools		kindergartens and first-grade classes open; remaining students on a rotation scheme (one week present, one week distance learning); distance learning for higher education except first-year students	kindergartens and first-grade classes open; second-grade classes on rotation scheme; everyone else on distance learning	distance learning except kindergartens and special schools (with practical education)
Sports events	up to 1,000 spectators outdoors, 500 spectators indoors	up to 500 spectators outdoors, 250 spectators indoors	no spectators	amateur events forbidden; professional events at a special regime	
Recreational sports	up to 2 teams indoors; special regime		up to 10 people indoors, individual sports only; up to 2 teams outdoors	indoor sports forbidden, up to 6 people outdoors	indoor sports forbidden, up to 2 people outdoors
Swimming pools, wellness centres	same as mass events			closed, except for healthcare providers	
Culture	up to 2,000 seats indoors; up to 1,000 standing spectators outdoors, 500 outdoors	outdoors, 1,000 seats	no spectators, special regime for people at exams		no events, professional artists at a special regime
Museums, art galleries	no restrictions	50% capacity	25% capacity	closed	

Castles, palaces, monuments	up to 50 people	up to 30 people	up to 10 people	closed
Libraries	special regime	up to 2 people/15 m2 and 2 m apart, special regime	up to 1 person/15 m2 and 2 m apart, special regime	only pre-arranged issue and returns of books at a single desk only contactless issue and return of books
Games, casinos, bookmakers	closed between 24:00 and 6:00; only sitting patrons, up to 6 people at a table; special regime	closed between 22:00 and 6:00; only sitting patrons, up to 6 people at a table; special regime	closed between 22:00 and 6:00; only sitting patrons, up to 4 people at a table, up to 50% capacity; special regime	closed
Food establishments	closed between 24:00 and 6:00; only sitting patrons; special regime	closed between 22:00 and 6:00; only sitting patrons up to 6 people at a table; special regime	closed between 22:00 and 6:00; only sitting patrons, up to 4 people at a table, up to 50% capacity; special regime	only takeaway service
Shopping centres	up to 4 people/15 m2 and 2 m apart, special regime and queue management	up to 2 people/15 m2 and 2 m apart, special regime and queue management, food and children corners closed after 22:00	up to 1 person/15 m2 and 2 m apart, special regime and queue management, only takeaway at food corners, children corners closed	only sale of essential products, home deliveries allowed for all; up to 1 person/15 m2 and 2 m apart; special regime and queue management; open outside of curfew, closed on Sundays and public holidays
Small retailers	up to 4 people/15 m2 and 2 m apart, special regime and queue management	up to 2 people/15 m2 and 2 m apart, special regime and queue management	up to 1 person/15 m2 and 2 m apart, special regime and queue management	only sale of essential products, home deliveries allowed for all; up to 1 person/15 m2 and 2 m apart; special regime and queue management; open outside of curfew, closed on Sundays and public holidays
Other services with own establishment	special regime			closed
Businesses - production and storage	special regime		special regime, recommended testing	
Businesses - offices and other services	special regime	recommended work from home	recommended work from home and testing	work from home where possible, recommended testing
Spas	special regime			closed, except for healthcare providers; limited number of people per room
Prisons	special regime		special regime, no visits	no visits
State of emergency needed	yes			
Control for implementation of restrictions	law enforcement services			



Note: "Special regime" means no cluttering and additional hygiene requirements

Source: Czech health ministry-----

Changes from previous version

The two versions of the anti-epidemic system are not directly comparable, as the previous version calculated restriction levels rather than a score. However, there are some common lines, particularly the threshold levels at which the various core/restriction level is applied. Given that under the new system, a lockdown starts effectively at Level 4 restrictions, we ran some scenarios and it turns out that the new criteria are laxer by about 15% than in the previous system. This is compensated through all the levels of restrictions available under the new system, as there will be a pretty low threshold at which at least some restrictions are applied. In addition, a major novelty is that a state of emergency will be required at any level of restrictions. It effectively means that the risk index should fall to 0 in order all restrictions to be eliminated, which we see as stricter.

There has been already some criticism about the new system, as Roman Prymula, the previous health ministry, said the new activation thresholds were too high. Yet, we don't quite see it that way, as we believe the difference is only marginal. What we believe makes the new system somewhat easier on restrictions is that the reproductive number, essentially a forward-looking indicator, and the percentage of unique positive tests tend to improve faster than the absolute number of new cases. The reproductive number and the percentage of positive tests can have up to a 30% weight each, compared to 20% for each of the new cases indicator, while they had equal weight in the previous system.

To provide an example, the updated criteria suggest that lockdown should have started on Oct 7, compared to Sep 27 under the previous system. The new system does agree that somewhat stronger restrictions should have started in the middle of September, rather than the beginning of October as it actually happened. The new system also agrees that no lockdown should have been applied in the spring, and it suggests a lower level of restrictions, Level 2, against Level 3 suggested by the older system. Still, it comes down to a difference at a couple of weeks, and we believe that a big part of the adjustment was due to political pressure, as otherwise the current lockdown would have been longer, not a very popular scenario at the moment.

Backward system application and predictions

Applying the system backwards, we get not a very rosy picture of the government's actions thus far. As we mentioned in the previous section, the government overreacted in the spring and it should have never implemented a lockdown under the system's criteria. In fact, only Level 2 restrictions should have applied, which entail mostly stronger disinfection efforts, less cluttering and most of all wearing a face mask indoors and in cluttered outdoor areas. Data suggest that the situation improved as soon as in early April, rather than at the end of its third week, when the lockdown was officially lifted.

On the other hand, our analysis shows that the government was largely reckless during the summer, as there was no point when restrictions were not required. Furthermore, indicators suggest that the situation started deteriorating around Jul 21, when the same level of restrictions as in the spring were required. Given the lack of action, it came down to even stricter restrictions being needed as of Sep 11. Since the government didn't really do much in that period, applying restrictions that could be seen as Level 1 at most, it was already too late and a lockdown became necessary as early as of Oct 7 (it was introduced on Oct 22).

Naturally, this is mostly academic, since if the government had applied some restrictions earlier, indicators might not have deteriorated so fast. It is the reason why the thresholds for almost no restrictions are so low, which should allow at least some level of control to be maintained.



At present, we believe that the lockdown threshold will be reached relatively quickly, by the end of this week. Our rationale is that the reproductive number already brings a 0 score, as it is currently under 0.7. As we mentioned above, our data tend to underestimate the number of new cases among seniors (very slightly) and the percentage of positive tests (by a couple of percentage points, from what we can see). Still, the level of improvement, even allowing for some slowdown in the next few days, suggests that we may see all three remaining indicators go to a lower threshold, which would bring a reduction in the overall risk index by 11 points. At present, the risk index is at 70 points, so such decline would bring it to 59 points or Level 3 restrictions. We are not 100% positive on the exact timing, as this could happen either late this week or early next one. However, we believe there is a relatively strong trend in all indicators that will allow lockdown to be lifted very soon.

You can find a file with the latest available data and our calculations (these are located in the rightmost columns of the spreadsheet). The rightmost column contains the official index score, along with colour-coded restriction level, as per the official methodology. Please note that EMW, which indicates the risk index score calculated by us, stands for EmergingMarketsWatch, the new brand of our product.

https://emergingmarketwatch.com/index/downloadfile/CZ_Covid_201116.xlsx

The biggest issue that remains is whether improvement will stick after lockdown is over. Judging from experience so far, we are not too optimistic, at least not until a vaccine arrives. In the best-case scenario, where a vaccine is made available in Q1 2021, the situation may just become to deteriorate. Yet, we believe that deterioration may come even earlier, as we expect many will travel to visit relatives for Christmas, which is likely to speed up community spread more than it did in the summer. Thus, we may have a situation where restrictions may need to tighten again in late February or early March. Hopefully, people will be more mindful this time, but we are not holding our breath. Still, there is a good news is - if a vaccine is indeed available in Q1 2021, then a new lockdown may not be necessary.

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