



CoVID-19 outbreak in KSA: impact and exit strategy

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Introduction

This report is meant to gauge the overall risks presented by the current outbreak of the COVID-19 (more commonly known as Coronavirus) in Saudi Arabia, how effectively the Saudi government responded to the outbreak, while also evaluating the various “exit” scenarios out of the current containment/suppression measures. The main focus of this report is to give a sense of the various factors that will likely help guide decision-making - both that of the Saudi government and, potentially, of local companies.

In light of the current situation, Le Beck’s CEO has decided to make this report complimentary, to give security professionals a more “zoomed-in” overview of the situation in the country.

- For more info on this report as well as Le Beck’s services please send us an email: Info.MENA@LeBeckInternational.com
- Or visit our website: <https://www.lebeckinternational.com/>
- Subscribe to our (complimentary) Daily Security Brief: <https://www.lebeckinternational.com/daily-security-brief/>

In addition, our local team stands ready to assist, both to design and implement an efficient and safe reopening strategy for local companies.

Current situation in Saudi Arabia

- ❑ Saudi Arabia reacted relatively swiftly when it came to containing the outbreak, likely because of its previous experience with the Middle East Respiratory System (MERS), and also because its initial testing capabilities were limited, thus pushing the country to take drastic containment and suppression measures to counter-balance such an initial lag
- ❑ While the number of cases appeared to be under control with the number of daily new cases remaining stable for around nine days, these daily increases have recently begun to double, driven by an increase in test numbers.
- ❑ Saudi Arabia has also moved to more specifically target densely populated neighbourhoods, including those housing mostly expatriate populations. As of April 22, according to the Ministry of Health, 23% of the overall number of confirmed cases are Saudi nationals, while 77% are expatriates.
- ❑ The uptick in the number of tests has also paved the way for more specific “targeting” of Coronavirus clusters, with the government implementing more lockdowns on specific neighbourhoods in the most-hit areas across the country. This may prove to be key to a swifter reopening of the country’s economy.

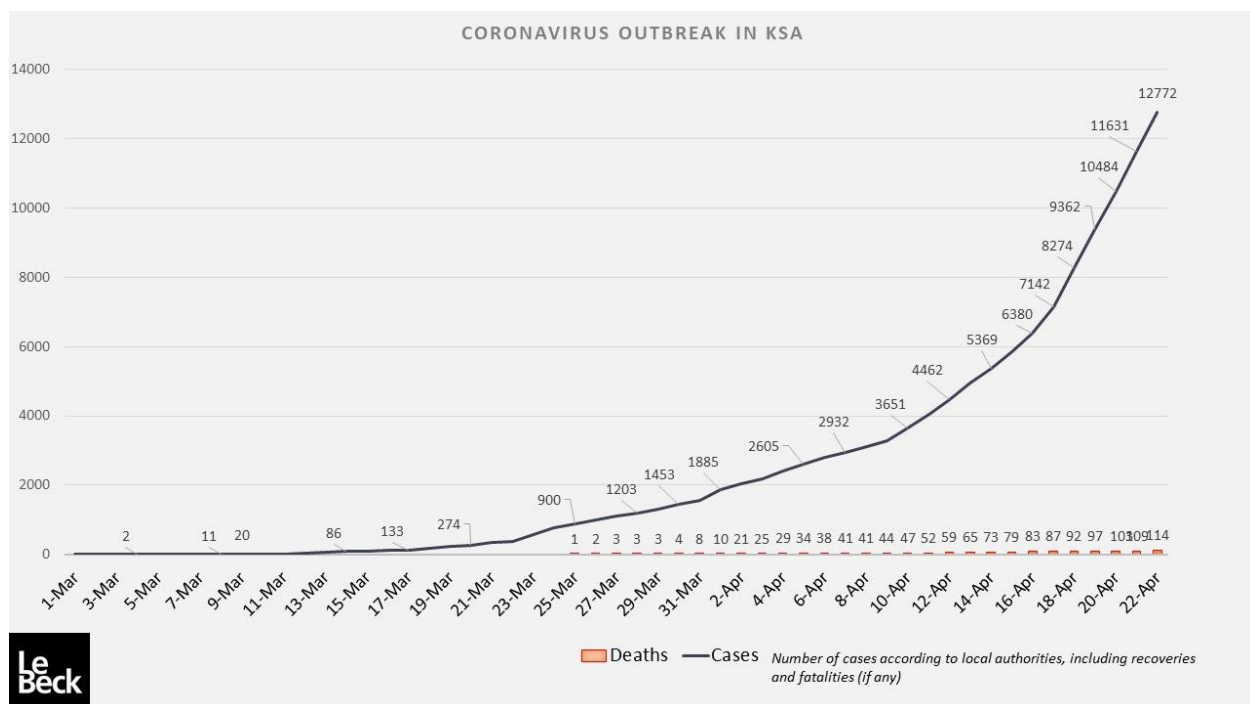


Figure 1 (click to enlarge): Number of cases (cumulative) in KSA as of April 20

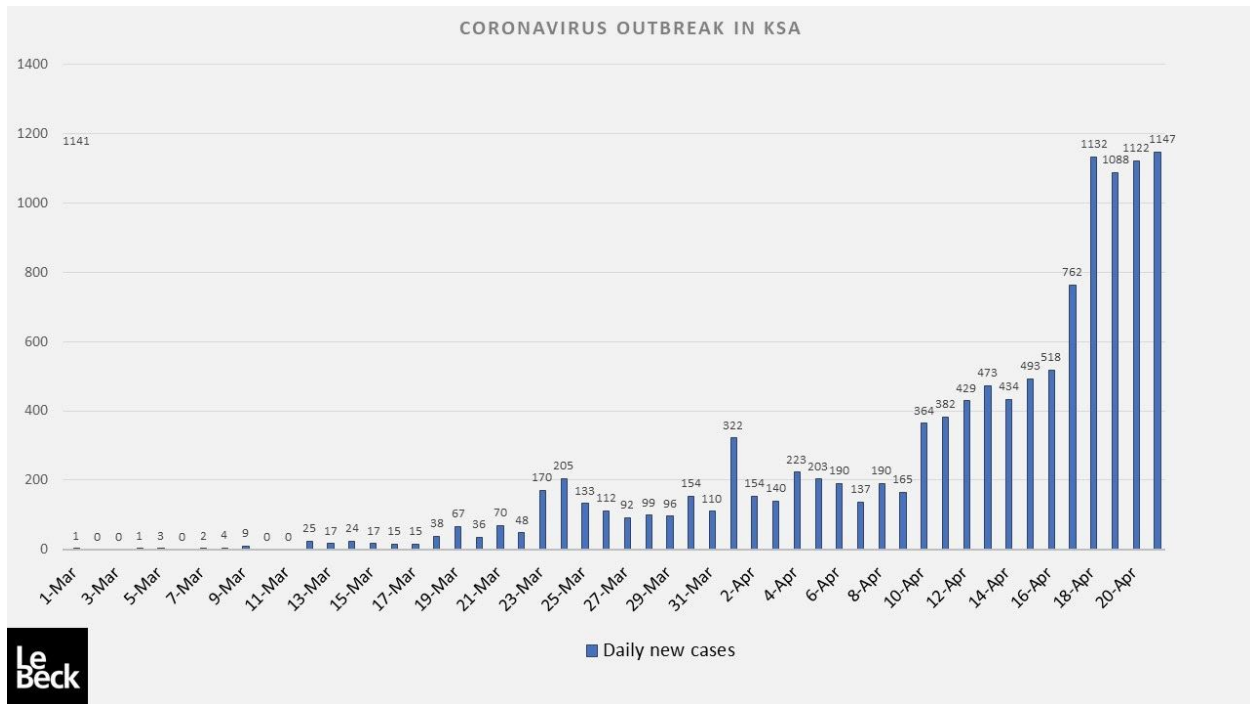


Figure 2 (click to enlarge): Number of daily new cases in KSA as of April 21

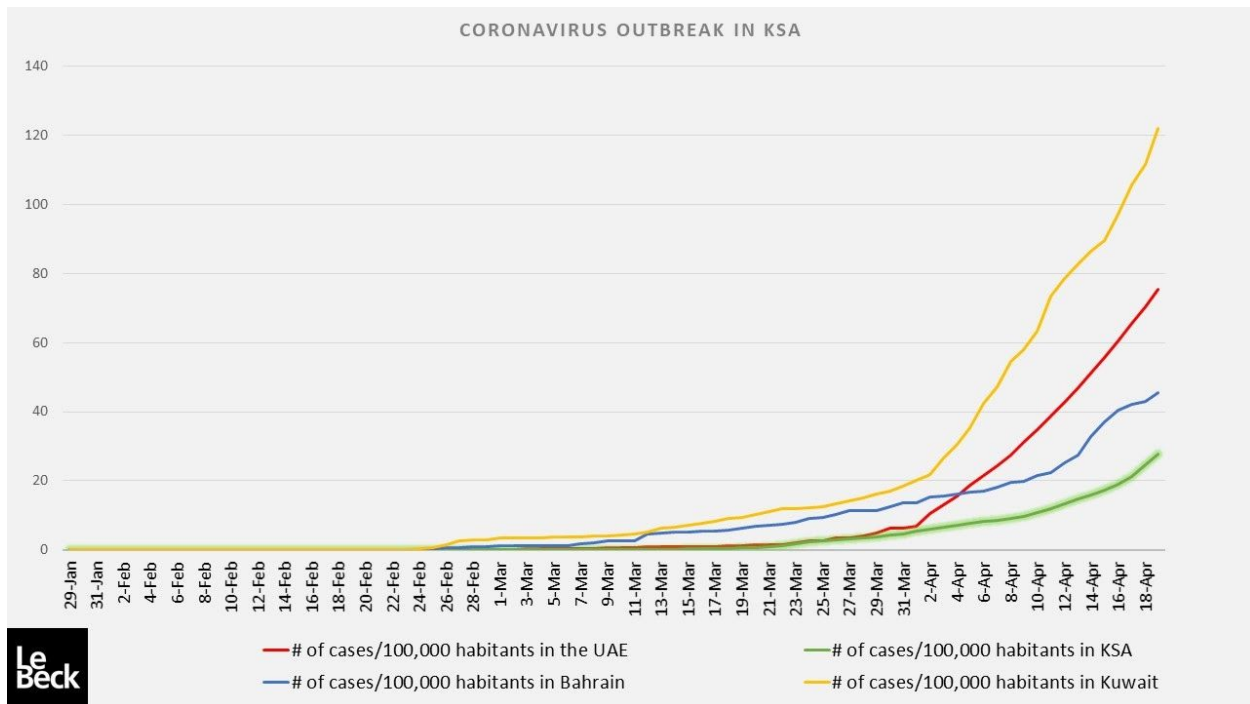


Figure 3 (click to enlarge): Number of cases/100,000 habitants in several Gulf countries as of April 19

Bottom line: Le Beck's assessment

- Le Beck's assessment is that given the current trajectory, **Saudi Arabia will likely be able to move to an exit strategy by the end of Ramadan.**
- Whether this exit strategy is slow or fast-paced will largely depend on (1) whether the country is able to continue ramping up testing to detect new cases, and (2) whether it decides to use tracing technologies to swiftly isolate those who have been in contact with confirmed cases.
- The first criteria (testing) is likely to be met within the Ramadan period, yet the number of tests needed to fully reopen the country (without tracing technology) means the reopening would likely be very gradual.
- If the country decides to use tracing technology, or if it ramps up testing by a factor of 10 during the month-long Ramadan holiday, a broader reopening of the economy may be considered.
- This reopening also largely depends on whether residents abide by social-distancing rules during the Ramadan period.
- Saudi Arabia may also use a Containment area strategy, by identifying high risk areas and applying more drastic social-distancing measures/delaying exit, to fasten exit of other areas - although political considerations are likely to play an important role in whether the country's authorities decide to implement such a strategy.
- The country's healthcare services are well-prepared to face the outbreak. Robust hospital capabilities give the country significant room to maneuver.

Methodology

All numbers in this report (with the exception of those in the Milestone sections and those for other countries) come from official Saudi sources, including the Ministry of Health.

Our method is based on several key “milestones” we assess should be reached before considering whether and how to reopen any country’s economy.

- There are two tracks of milestones we’ve identified, one that implements a deliberate strategy with testing, and the other that serves to gauge how efficient the various measures taken to contain the outbreak are.
- These milestones are based on (1) case-studies of countries that already started lifting their restrictions and (2) Le Beck’s own calculations.

Below are a summary of these milestones and where we assess Saudi Arabia stands at this point:

Cases & Daily increases track

Milestone 1 <i>Average percentage increase below 33%</i>	Milestone 2 <i>Average percentage increase below 11%</i>	Milestone 3 <i>Stable daily new cases</i>	Milestone 4 <i>Daily new cases decrease</i>
✓ Reached	Within reach over coming month	Within reach over coming month	Within reach over coming months

Testing & tracing track

Milestone 1 <i>Enough tests to isolate theoretically isolate secondary infections</i>	Milestone 2 <i>Testing capabilities comparable to countries that have started lifting restrictions</i>	Milestone 3 <i>Daily testing number targets for the stabilisation of the outbreak reached</i>
✓ Reached	Within reach over coming month	Within reach over coming month if tracing technology are used, within months if not

Case study: Exit strategies

Within the past two weeks, several countries around the world have announced the easing of restrictions put in place to suppress and contain the spread of the Coronavirus which means we now have several other situations whose metrics for reopening and which sectors were prioritized we can examine. These different approaches to fighting the virus which are influenced by their geography, political economies, health systems, and the timing of decisions has been taken relative to the presence and spread of the virus. We therefore caution against drawing any too firm of conclusions nor do we at all presuppose what Saudi Arabia should do in regards to its anti-Coronavirus campaign. Our aim, rather, is to identify some parameters that Saudi authorities are likely to be looking at

To date, Norway, Denmark, Austria, and Jordan have announced the easing of some restrictions put in place to fight CoVID-19 while discussions are taking place elsewhere.

- For the purposes of our analysis, we have excluded China on the basis that official numbers may not reflect the scope of the outbreak.
- While we've decided to add Jordan, as one of the only Arab countries that started to lift some restrictions, we also assess it may have started lifting restrictions earlier, due to concerns over its economy.
- All case, fatality, and testing numbers were taken from each country's relevant Health Ministry page.

Testing

We identified two sets of parameters which appear to be deterministic in decisions to ease restrictions. The first parameter is the level of testing in a country. Transparency about testing varies widely between countries with what is defined as a "test" for the virus being somewhat vague in some circumstances and possibly interchangeable for a "check". I.e. some countries initially reported temperature taking and other symptom checks as a "test" in lieu of a more definitive mouth swab or blood test. That said, the countries used for comparison and Saudi Arabia have either been very transparent about their testing numbers or become more so as time has gone on.

As we see below, Saudi Arabia's testing numbers relative to its population size are comparable to that of Denmark's and Jordan's, though not at the levels of Norway or Austria. Saudi Arabia also recently launched an app, Mawrid, that allows users to self-diagnose CoVID-19 symptoms and track confirmed cases.

	Saudi Arabia	Norway	Denmark	Austria	Jordan
Confirmed cases	10,484	7,156	7695	14,873	425
Population	33700000	5368000	5603000	8859000	9956000
CoVID19-related deaths	103	181	364	491	7
Total reported tests	200,000	109,507	27,109	156,801	33,000
Average number tests/day	7500	3401	4032	5561	1000
Average number tests/day per inhabitant	0.0002	0.0006	0.0007	0.006	0.0001
Tests per 1,000 inhabitants	5.9	20.4	4.8	17.7	3.3

*Information valid as of 21 April

Higher levels of testing not only allow authorities to gain a fuller picture of the scale of the outbreak but gives them information that could allow individuals confirmed to have already been infected by the virus to go back to work. Discussions around a sort of “Coronavirus passport” have taken place - with China beginning to issue people have recovered from the virus - and this could be one way to allow individuals to return to the workforce more quickly.

We believe that mass testing is the ultimate goal for many countries, including Saudi Arabia, as they work towards the long-term goal of fully reopening. Randomized testing also appears to be an important health tool, though most countries appear to be rolling that out as their campaigns go along with the priority for testing being placed on vulnerable populations (elderly, immune deficient, etc.), health workers, or those already demonstrating symptoms.

Consecutive days of falling cases

A second important parameter that we assessed was the number of consecutive days of below 11% case growth a country experienced before announcing the easing of restrictions. At 11% increase, the number of cases doubles every week, and we assess that maintaining below 11% case growth means health services are able to stay on top of new cases without being overwhelmed.

	<u>Saudi Arabia</u>	<u>Norway</u>	<u>Denmark</u>	<u>Austria</u>	<u>Jordan</u>
Confirmed cases	10,484	7,156	7695	14,873	425
Population	33700000	5368000	5603000	8859000	9956000
# of days 10% (or less) daily increase in new cases before easing of measures announced	N/A	13 days (27/3 13% increase to 2.5% increase on 8/4)	7 days (10/4 10% increase to 10/10 only 3.2% increase)	15 days (9.9% increase on 30/3 to 0.76% on 13/4)	20 days (10% increase on 27/3, 1% on 15/4)

*Information valid as of 21 April

As we can see, **no country so far has announced an easing of restrictions with less than seven days** of consecutive, under 11% case growth, while the first country in the MENA region to have done so waited 20 days before making its first announcement.

Which sectors to open first?

For countries that have begun to bring outbreaks of the Coronavirus under control the question of where and how to reopen their societies becomes more pressing. The pent up frustration and desire of working populations to return to their jobs places political pressure on governments. At the same time, public health considerations have to continue to be taken into account and an unmanaged and rushed reopening could result in a spike in cases, an overwhelming number of hospital beds, and a political backlash. As such, every country that has begun to remove CoVID-19-related restrictions is doing so very cautiously with specific rules and restrictions still in place.

In all four of the countries chosen for comparison, **increased freedom of movement was one of the first measures announced**. In Norway, Austria, and Denmark non-essential movement was permitted again although large-gatherings and recreational activities like attending major sporting events and public pools are still banned. Of the four countries examined for comparison and the one other in the MENA region, Jordan had the most

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stringent restrictions on the movement of people and has now allowed people to move more freely in some regions outside the capital though the curfew that restricts the movements of the entire population and imposes total shutdowns during weekends has not yet been lifted.

There was a marked split in strategies taken when it came to whether to immediately begin reopening schools and daycares. Both Denmark and Norway announced that daycares and secondary schools would gradually be opened within two weeks of the announcement – thus allowing a larger portion of the adult workforce to return to their jobs and minimize the interruption in the schooling term for pupils. By contrast, Austria has reopened certain businesses while only just announcing that some schools would reopen on 15 May. Jordan has not yet announced the reopening of schools or universities. This underscores the lack of consensus around to what degree sending pupils to schools or students commuting to universities would be another major source of transmission. For universities the point is less acute, since many classes have moved online.

While allowing children to return to school frees up part of the workforce, **the impact on the economy is still dependent on businesses being allowed to operate.** To that end, Austria has instead of reopening school, focused on opening non-essential stores under 400 square meters along with hardware stores and garden centres. On May 1 shops, shopping malls and hairdressers are scheduled to follow suit. Jordan has also announced that some businesses will now be allowed to operate, although to date it has not specified which types or sizes of businesses. Denmark and Norway have ordered that most restaurants, bars, and hair salons remain closed, though Denmark has already announced that it will reconvene on 10 May to discuss its next moves.

In short, the four other countries examined for exit strategy comparisons announced some relaxing of movement restrictions. At the same time, there seems to be a split in whether to prioritize the reopening of schools or smaller and/or non-essential businesses. In all cases, at least a week of sustained below-11% new case growth in a downward trajectory was a prerequisite before any restrictions were lifted, something that Saudi Arabia has yet to achieve.

Key Factors for re-opening KSA's economy

Below are the key factors we assess will be taken into account when it comes to reopening Saudi's economy. For questions on our methodology please refer to the annex at the end of this document.

- Please note that the sole focus of these factors are health-based, likely representing only half of the equation, the other half being being dependent on the country's economy. While no country can sustain an indefinite period (or periods) of suppression, some countries can afford to shut their economies for longer than others.
- Note that there are many unknowns with regards to the virus, with key data on CoVID-19 varying significantly. *Our assessments should thus be viewed as broad estimation to give a general idea of the decision-making factors.*
- Rather than presenting an accurate "prediction" of when and how the country could reopen - which we assess is difficult and would require epidemiological models that we cannot produce - the goal of this study is to present factors that can be easily tracked to gauge how close Saudi Arabia is to reopening its economy.

Number of cases & daily increases

As mentioned above a key indicator is the number of cases, but more importantly, the number of new daily cases. Below are the various milestones regarding the number of cases and daily increases.

1: Maintaining a stable percentage of increase, below 33% is the first milestone, as countries that saw 33% increases have generally lost control of the outbreak. According to a CDC study, the number of Coronavirus cases doubles every two to three days, meaning that the measures taken by countries who see lower doubling time are working.

- Saudi Arabia has  **successfully** avoided that scenario due to its swift reaction to the crisis.

2: Maintaining a stable number of increase below or equal to around 11% is the second milestone, as it suggests the various measures are working to significantly decrease the transmission rate to a point where emergency services have time to prepare, and where the government has enough time (a week) to plan ahead and correct course.

- Saudi Arabia has yet to reach that milestone, although recent numbers suggest this is **within reach over the coming month**, particularly as, after an uptick, the average number of new cases is stabilising. We assess the country is likely to be able to reach that milestone during Ramadan if social-distanciation measures continue to be efficient.

3: Maintaining a stable number of new cases is the third milestone: Theoretically, after a number of days (depending on the average number of days it takes for a patient to exit the hospital) in which new cases are stable, the number of patients entering hospitals will be equal to the number of patients exiting hospitals. In other words, at this stage the risk that emergency hospitals will be overwhelmed will have noticeably decreased.

→ Saudi Arabia has yet to reach that milestone, although recent numbers also suggest this is **within reach over the coming month**. Similarly, we assess the country is likely to be able to reach that milestone during Ramadan if social-distanciation measures continue to be efficient.

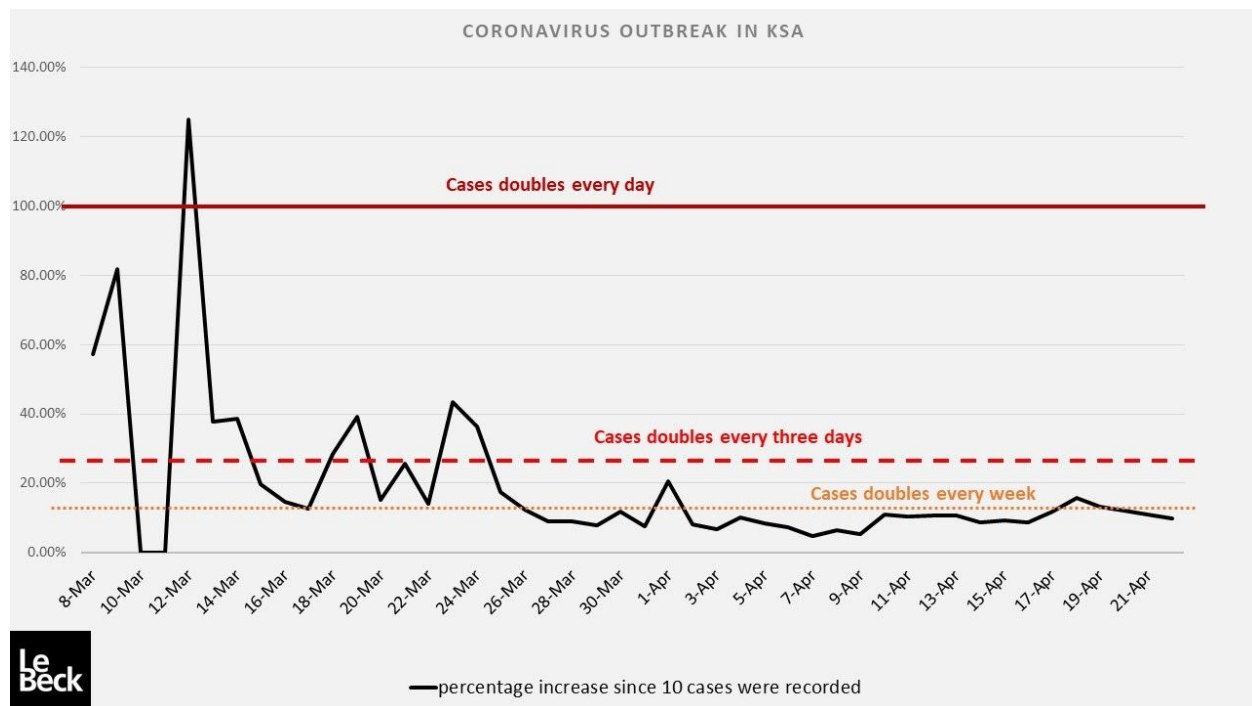


Figure 4 (click to enlarge): Daily percentage increase

4: Durable decrease in the number of daily new cases (in absolute numbers). At this stage the risk of seeing healthcare services being overwhelmed will have significantly decreased and the number of patients exiting hospitals will start to be higher than those entering them.

→ Saudi Arabia has yet to reach that milestone, although recent numbers also suggest this is **within reach over the coming months**. The campaign of mass-testing (see below) led to a spike in the number of daily new cases, and may be followed by an opposing trend, with a decrease to lower levels over the coming month. Yet this would only represent a relatively artificial decrease, with the real test being whether Riyadh can start to more durably decrease the number of cases.

Number of tests/tracing capabilities

Another key factor is the number of tests performed overall and on a daily basis. Testing on a large-scale basis is not only important to gauge the scope of the outbreak, but it is also a way to contain the outbreak by rapidly isolating cases. Similarly, tracing capabilities (the ability to trace and isolate those potentially in contact with confirmed cases) are key.

There is almost a “zero-sum game” between containment/suppression measures and the testing/tracing capabilities, i.e. when one increases the other can decrease. Saudi Arabia may have initially lagged behind in terms of testing capabilities (so did most countries), yet it counter-balanced this initial delay by taking swift and broad containment/suppression measures. The opposite trend is also likely to be seen: As Saudi Arabia increases its testing and tracing capabilities, it will be able to reopen part of its economy.

Below are the various milestones we assess Saudi Arabia will have to go through to reopen its economy. Note that these numbers depend on a variety of factors - particularly the average number of new daily new cases - that can change over the coming weeks (see the [annex](#) for more details and caveats on these numbers). These are meant to provide rough estimates, rather than accurate numbers.

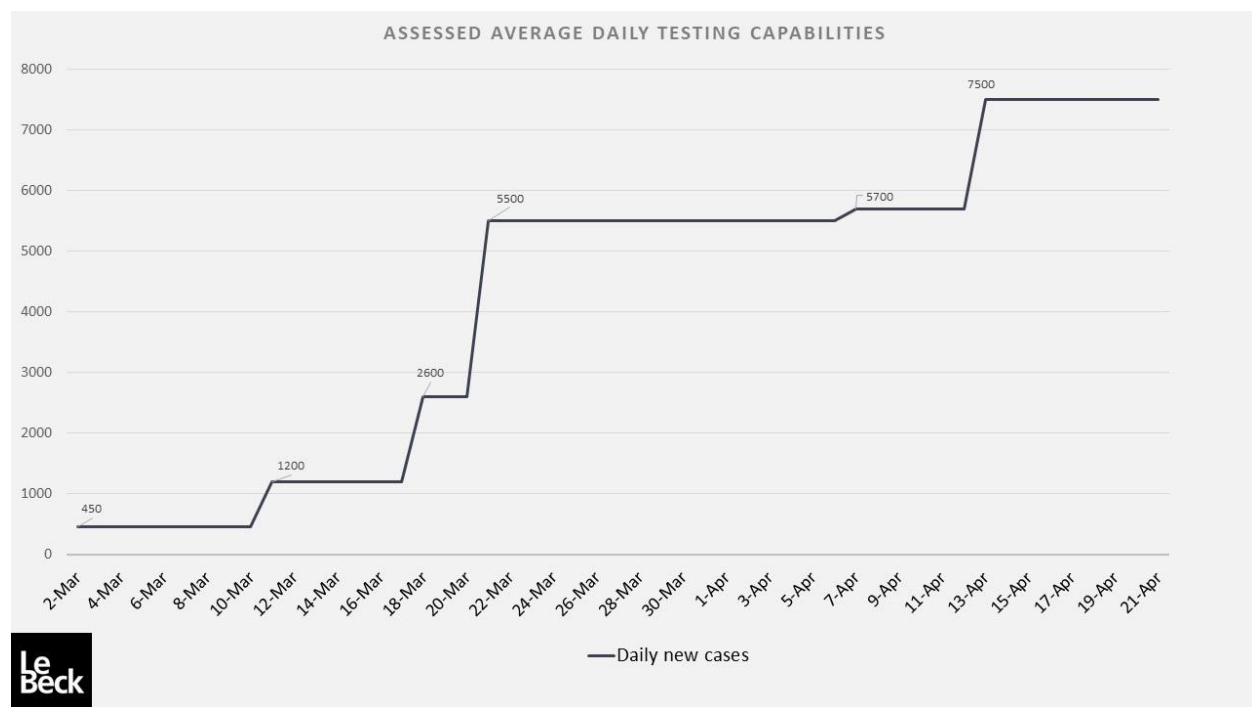


Figure 5 (click to enlarge): KSA's assessed daily testing capabilities as of April 21

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1: Enough tests/day to (theoretically) isolate all secondary infections: This milestone means that the country has enough tests to theoretically check all of the patients who were infected by the previously confirmed CoVID-19 cases the day before. Note that this does not mean that all new cases are found given that it takes more than one test to isolate one case. At lower testing numbers, we assess countries likely won't even start to draw any kind of exit strategies.

- We assess it would take an estimated 5500 tests/day to reach that goal (see the [annex](#) for our methodology in estimating that number).
- Saudi Arabia ✓ **successfully** passed that milestone around a month ago.

2: Daily testing capabilities similar to that of countries that lifted restrictions: The relevant examples (Norway, Denmark and Austria) were testing around 0.06% or more of their population every day. Note that, as mentioned above, this is not a perfect factor for reopening, given that economic and political factors also impact these countries' decisions to reopen.

- Saudi Arabia has yet to reach that milestone and would need to triple its testing capabilities. Given the current trajectory and a very significant effort to increase testing, we assess this milestone is **within reach in the coming month**.

3: Daily testing number targets for the stabilisation of the outbreak reached: At this level the country is able to isolate enough cases to see the number of new cases remain the same every day. Higher numbers of daily tests than the numbers below should help gradually decrease the daily number of new cases.

- For Saudi Arabia, we estimate that this number is around 77,000 tests/day. This number falls very significantly to an estimated 9600 tests/day should Saudi Arabia use some form of tracing technology to check those who have been in direct contact with confirmed patients.
- If Saudi decides to use tracing technology, we assess this milestone is **within reach in the coming month**.
- Otherwise it may take **several months** to reach such testing capabilities.

Containment zones

The outbreak hasn't impacted all regions and cities across Saudi Arabia in the same way. There are, in fact, natural "high-risk" areas - the ones that are currently being tested and explain the increase in the daily number of new cases reported by the Saudi Ministry of Health. This includes the more densely populated neighbourhood, which also typically host poorer segments of the population that both do need to work and generally do not work in sectors where working from home is possible.

The Saudi Arabian government has already started to implement more specific lockdowns on high-risk areas (although this would certainly pose some political risks) or areas where the number of cases per inhabitant is higher.

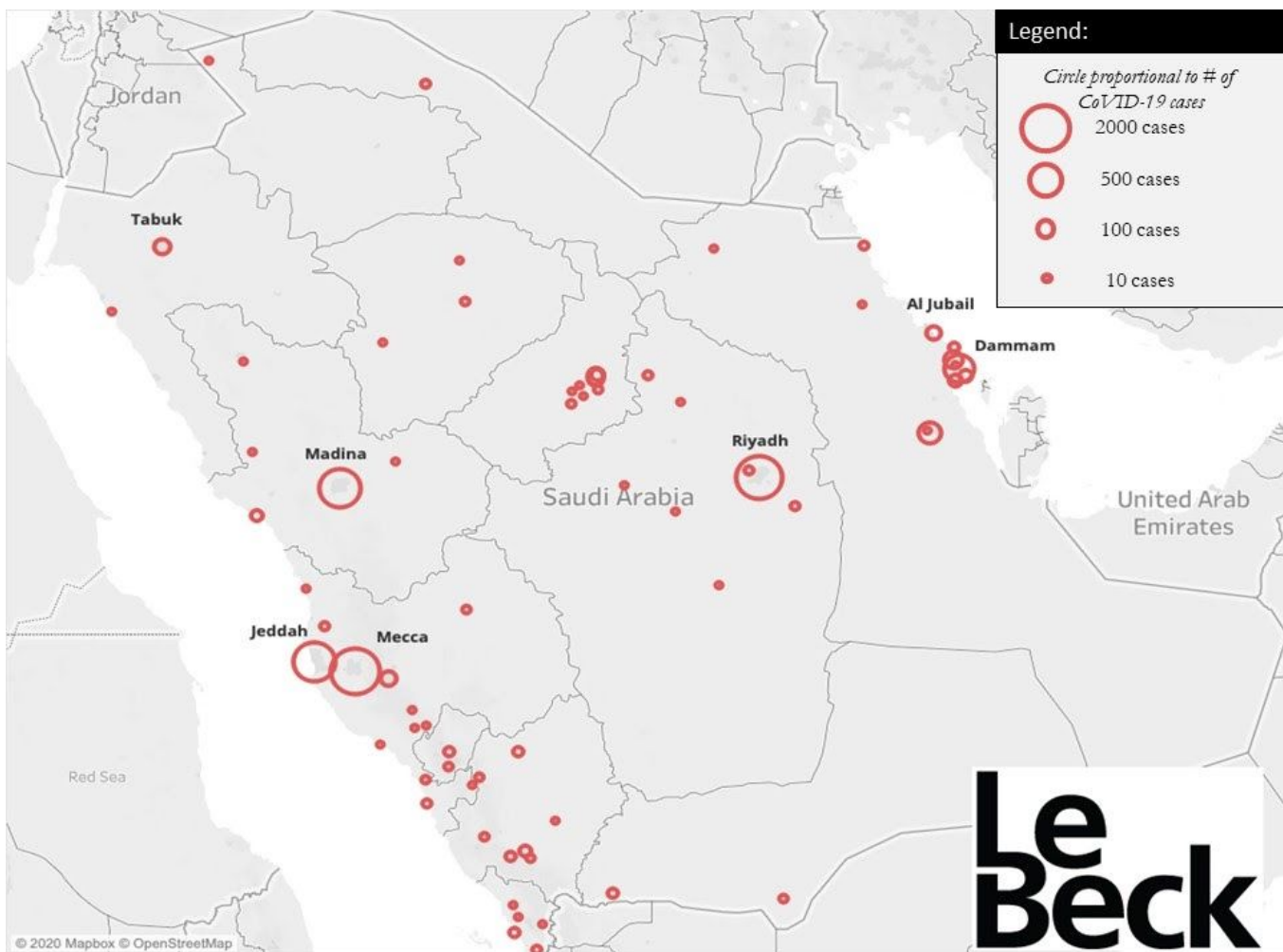


Figure 6 (click to enlarge): Number of cases per city, as of April 21

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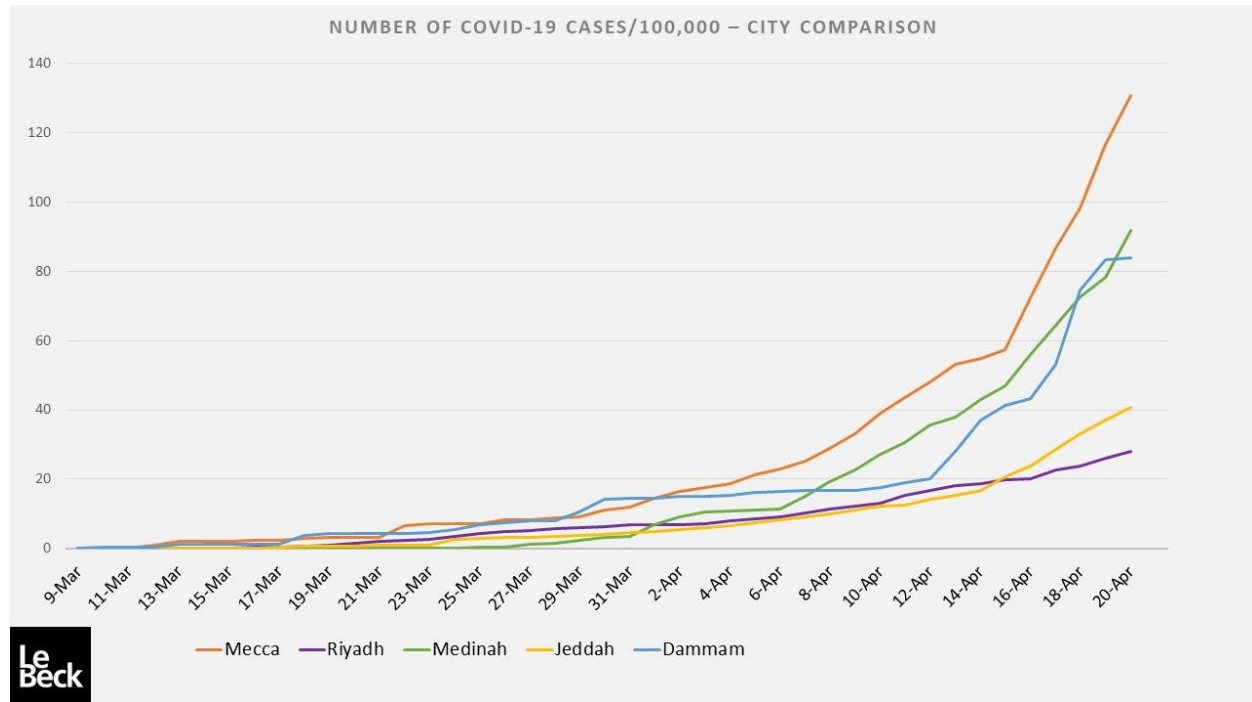


Figure 7 (click to enlarge): Cases/100,000 resident comparison between four cities as of April 21

There are no clear milestones here, other than containment/high risk areas being identified and moving along the exit strategy at a different time than other lower-risk areas. The graph above, for instance, shows significant variations between cities that have maintained a lower number of cases per inhabitant (Riyadh and to a lesser extent Jeddah), and other cities from where most new cases seem to be coming.

By identifying high-risk areas, local authorities can focus on these by increasing testing numbers and/or applying more drastic restrictions - although again there is a political factor here, given the risk of unrest within these high-risk areas if inhabitants feel they are unjustly targeted by drastic restrictions.

Health services capabilities

Contrary to multiple countries in the region that have had to significantly revamp their emergency response and increase healthcare preparedness, the fact that Saudi Arabia already went through a similar health crisis very recently (namely the Middle East Respiratory Syndrome or MERS) means that many of the tools to respond to such crises were already in place.

The Ministry of Health initially designated dozens of hospitals for reception of CoVID-19 patients, amounting to 80,000 hospital beds and 8000 intensive care units (ICU) beds. With less than 13,000 cases at the time (most of which likely not requiring hospitalisation) the country is well prepared and has significant room to maneuver. Similarly in terms of ICU capabilities, the country is still likely far from reaching a significant portion of its capabilities: When the number of CoVID-19 cases was at around 8000 the country reported less than 100 critical cases (around 12% of the cases).

The country's hospital capabilities on a regional level (see table below - numbers are from 2018 and have increased since) also limits the possibility of local services being overwhelmed in a specific region (as was the case for instance in northern Italy or Eastern France), although there are still areas at greater risks than others, including Meccah and to a lesser extent Medinah - although these are likely still not at 50% capabilities and patients likely can be transferred given the proximity of other cities with more capabilities.

الإجمالي Total		القطاع الخاص Private Sector		الجهات الحكومية الأخرى Other Governmental Sector		وزارة الصحة MOH		المنطقة Region	
عدد الأسرة Beds	عدد المستشفيات Hospitals	عدد الأسرة Beds	عدد المستشفيات Hospitals	عدد الأسرة Beds	عدد المستشفيات Hospitals	عدد الأسرة Beds	عدد المستشفيات Hospitals		
19156	106	5747	41	5072	16	8337	49	Riyadh	الرياض
3360	18	473	7	193	1	2694	10	Makkah	مكة المكرمة
8675	57	3714	40	1870	4	3091	13	Jeddah	جدة
3988	25	489	4	859	5	2640	16	Ta'if	الطائف
4553	34	1135	12	650	3	2768	19	Medinah	المدينة المنورة
3202	23	343	4	0	0	2859	19	Qaseem	القصيم
9389	51	4081	23	1952	8	3356	20	Eastern	الشرقية
2953	17	728	6	270	1	1955	10	Al -Ahsa	الأحساء
1439	10	150	2	289	1	1000	7	Hafr Al-Baten	حفر الباطن
3982	34	1137	12	515	2	2330	20	Aseer	عسير
770	7	0	0	0	0	770	7	Bishah	بيشة
2548	15	86	1	642	2	1820	12	Tabouk	تبوك
1960	16	170	3	0	0	1790	13	Ha'il	حائل
1360	10	0	0	0	0	1360	10	Northern	الحدود الشمالية
2513	25	250	3	38	1	2225	21	Jazan	جازان
1862	16	250	3	312	3	1300	10	Najran	نجران
1295	12	130	2	0	0	1165	10	Al-Bahah	الباحة
1330	9	0	0	0	0	1330	9	Al-Jouf	الجوف
490	4	0	0	0	0	490	4	Qurayyat	القريات
400	5	0	0	0	0	400	5	Qunfudah	القنفذة
75225	494	18883	163	12662	47	43680	284	Total	الإجمالي

Figure 8: Hospital capabilities in the main health regions of KSA, as of 2018

Annex

Estimation of the average number of daily tests needed

Methodology

We assess the best way to assess the question of how many daily tests are needed is to consider for each confirmed case of Coronavirus how many people should then be tested. This variable depends entirely on R_0 (the average number of people who will be infected by one sick person) which has been estimated in multiple studies, with various numbers being reported. While initial studies suggested the R_0 varied between 2 to 2.5, a new [study](#) by the CDC found a much higher number, namely **5.7**. We have decided to use this most recent study - although again, the lack of solidified data on the virus decreases the accuracy of our result.

- Note that the R_0 depends (amongst several other parameters) on the average number of contacts per day of individuals in a specific population. Suppression measures use this factor to decrease transmission rates.
- This also means that the number of tests needed to fully reopen the economy is higher than that required to reopen segments of it - once again highlighting our assessment that there is a “zero-sum” game between testing capabilities and the ability to reopen the economy.

Minimum number of tests to isolate secondary infections

By multiplying the average number of new cases by this R_0 number, we get an estimate of the *minimum* number of tests required to isolate all cases - minimum because a much higher number of tests will be needed to actually find this average number of secondary infections. As of now, for Saudi Arabia, with an average of **961** new cases a day over the past week (which we assess is a more accurate measurement given the recent mass-testing), this would for instance suggest the country needs to carry out a minimum of **5478 tests/day**.

Number of test/confirmed case

It does, however, take a relatively high number of tests to find one Coronavirus case. Saudi Arabia has, for instance, found **1 Coronavirus case out of every 17 tests**.

- Note that this calculation is imperfect: A country that would carry out very little tests, would have a much higher “success rate” despite being in a far worse situation. However, at this point, Saudi Arabia is carrying out enough tests that we can take this number as a broad estimation of the number tests needed to find one case.
- A better calculation would take into account the the number of symptomatic cases vs asymptomatic (given that symptomatic cases are easier to detect and require less tests/confirmed case) as well as the average number of contact per day and average number of day it takes for one case to be detected. In the absence of solid data on this we’ve decided to use the imperfect measure above.

- Also note that this highlights the **critical importance of tracing**, i.e. of identifying the individuals that have been in contact with an infected patient (and possibly for how long). This significantly reduces the number of tests needed to detect one CoVID-19 case. Politically, however, this does pose questions with regards to large-scale surveillance in the case of mass contact tracing.

There aren't enough studies on the impact of tracing to quantify by how much tracing cuts the average number of tests needed to find one CoVID-19 case. Countries that used mass-scale tracing technologies early on have had to carry out far fewer tests than comparable countries. For instance, Taiwan carried out around **8 times less** tests than Australia - both have a similar population. We have thus divided the number of tests needed to find one CoVID-19 case by that factor - although, again, this is largely an assumption, as it is not grounded in solid data.

By multiplying our previous number of the average minimum tests per day needed to isolate secondary infections by 17 (the current estimate success rate of infections found vs tests), we obtain a measure of how many daily tests KSA would need to carry out to have a high chance of finding the new Coronavirus cases on a given day. At this time, this means that if the number of daily new cases remains the same on average, KSA would have to carry out **93,126/day** (17×5478) to fully reopen its economy (henceforth the "ideal" number of tests/day without tracing). Note that this is at a time when Saudi Arabia is likely catching up to many cases that were previously unreported. Over the coming weeks we assess there is a high likelihood that the average number of new cases will start to fall over the coming weeks.

With tracing - and with all the caveats we mentioned before due to the lack of solid data - we assess that number can be reduced to **11,641** ($(17/8) \times 5478$ - henceforth the ideal "ideal" number of tests/day with tracing).

Stabilisation and gradual decrease.

To calculate the number of tests needed to stabilize the number of new cases, i.e. to have the same number of new cases every day, we have multiplied the "ideal" number of tests by around 0.825.

- If we have 100 cases and 82.5% are detected, the other 17.5 will infect 100 (17.5×5.7) people and so on and so forth.

This also means that numbers obtained with this calculation are bars after which the number of cases should theoretically decrease. For Saudi Arabia, this means that the estimated number of tests to stabilise the number of cases without tracing is **76,829** (93126×0.826), while it falls to **9604** (11641×0.825). Below these numbers, the expected number of new cases should start decreasing every day.

- Note that every time a country falls below these aforementioned daily number of tests, it adds to the future number of required tests, as undetected cases accumulate - underscoring the importance of ramping up testing quickly.

Any questions? Reach us at: Info.MENA@LeBeckInternational.com