

# Making the Fight against the Coronavirus Pandemic Sustainable

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# Summary and Recommendations

## I. Current Situation - the Corona Pandemic to Date

The current pandemic with the SARS-CoV-2 virus confronts Germany, like many other countries, with problems unknown to date: A new virus spreads rapidly from person to person and causes serious illness in some patients (COVID-19). Since the virus and the diseases it causes are still relatively unknown, the risks can only be assessed with great uncertainty.

The number of people tested positive for the virus (i.e. acutely infected) in Germany has been increasing exponentially for weeks, and it is likely that many more infections are going undetected. Only with the availability of valid antibody tests will it be possible to determine how many people have experienced an infection - detected or undetected. The number of undetected cases could be high. With a time delay due to the incubation period, the number of seriously ill patients and deaths also increases. This leads to regional clusters, in which infections occur with a high temporal and spatial frequency.

In view of this situation, the German federal and state governments have decided on a number of measures. These include a strengthening of the health care system, a very successful expansion of intensive care capacities and measures to slow down the spread of the infection. These restrictions, some of which interfere deeply with basic rights, include regionally varying contact restrictions, and more or less strict curfews, as well as the closure of various businesses and prohibition of events (colloquially: *shutdown*).

The aim of these measures is to flatten the previously steeply rising curve of infection rates, to avoid overburdening the health care system and thus to reduce cases of serious illness and death. The effectiveness of the measures will only become apparent with a delay (due to the long incubation period); initial data suggest that they can indeed reduce the number of infections in Germany.

At the same time, these measures have negative consequences for medical care for diseases other than COVID-19, and overall for health, social and psychological concerns and for the economic foundations of our society. In addition to medical risk groups, all this affects in particular socio-economically disadvantaged people, the elderly, people with disabilities, single parents and families with small children, people living alone, the homeless, sick and mentally unstable people.

Many companies are currently ceasing production: due to legal requirements, out of fear of infection, or because of interrupted supply chains. The cost of the lost value added in Germany is between 4.3 and 7.5 percent of GDP (approx. 150-260 billion euros) with a one-month *shutdown* followed by a gradual economic recovery. If extended, the cost would rise disproportionately. A functioning economic system is a prerequisite for a functioning health care system.

Added to this are the costs of the lack of investment in education due to the closure of schools and universities. This failure reinforces inequalities. Economic crises and unemployment also have high health and social costs in the form of increased physical and mental illness and reduced life expectancy. Here too, groups that are already socio-economically weak are particularly burdened.

## II. Recommendations for a Risk-Adapted Strategy

### a. Objectives

If the current restrictions were to be lifted completely, the virus, which is still present in Germany, could once again spread very rapidly in the largely non-immune population and cause a large number of serious diseases. It is currently not possible to predict when an effective vaccination or a broadly applicable therapy will be available; we expect neither of these to be available before 2021. Neither this nor sufficient natural immunity in the population can be waited for while maintaining current restrictions.

Therefore, future measures must be designed and prepared in such a way that, on the one hand, they ensure good health care and, on the other hand, that they can be sustained over the necessary periods of time. We therefore recommend a **gradual transition to a risk-based strategy** that combines a relaxation of restrictions in the social and economic environment with continued effective health protection. There is an immediate need for action now in order to design, prepare and initiate targeted adjustments to the packages of measures. The transition from current restrictions to such a risk-adapted strategy should be gradual.

The following objectives are central to this:

- To largely prevent the virus from spreading again rapidly, which allows at the same time the natural immunity in the population to slowly increase;
- To strengthen the health care system to ensure the best possible treatment for as many patients as possible - with COVID-19 as well as with other serious diseases;
- To protect groups at high risk for severe COVID-19 diseases;
- To avoid social and psychological hardship in the fight against the pandemic as far as possible;
- To make economic activities possible without taking unnecessary health risks;
- To limit restrictions of fundamental rights to the minimum and in accordance with the principle of proportionality.

### b. Measures

We recommend a gradual approach to a risk-adapted strategy that is oriented towards nationwide as well as regional opportunities and threats. This should be accompanied by a na-

tionally and regionally organised **Corona Task Force**, in which experts for the various objectives mentioned above work together with representatives of societal groups. The purpose of the *task force* is to prepare the political decision-making process and make appropriate recommendations, as well as to accompany and communicate the implementation of these decisions. The *Corona Task Force* consists of a *National Task Force* based at the Federal Government and *Regional Task Forces* at the level of the federal states, which are in close contact with each other. They collect all relevant information required for flexible control of individual steps. The *National Task Force* has the task of overall coordination.

The *Task Force* will combine measures for effective health protection with a gradual relaxation of restrictions in the social and economic environment. This will include:

### **Specific measures for health protection**

The following precautions are to be taken within the framework of the risk-adapted strategy, with particular attention being paid to the protection of risk groups:

- Comprehensive information and training on the necessary hygiene measures;
- Broad information and binding specifications for the use of protective equipment (adapted according to risk areas);
- Coordinated, large-scale testing to monitor the spread of the virus and the increase in immunity in the population
- Restoration of comprehensive and unrestricted medical care for the population.

Several specific measures are to be organised urgently:

- The massive increase in the production of protective clothing and masks in Germany;
- Securing production capacity for vaccines and drugs in Germany;
- The regional and supra-regional coordination of ventilation capacity, designation of priority centres and stabilisation of needs-based expansion;
- The establishment and expansion of an IT-based structure for coordination and strategic planning.

### **Measures for society and the economy**

Urgent action must be taken in the social field:

- To strengthen the capacity and expand funding opportunities for assistance for people from risk groups;
- To strengthen the capacity and expand funding opportunities for coping with psychological and social consequential damages of the above-mentioned restrictive measures (psychotherapeutic support, counselling services, educational support, etc.).

## Summary and Recommendations

The following four criteria should be taken into account for a gradual and risk-adjusted opening:

- Risk of infection with SARS-Cov-2;
- Risk of severe COVID-19 disease;
- Relevance of the respective area of the economy and social life;
- Possibility of imposing and maintaining safeguard measures.

The concrete measures can be differentiated according to (1) regions, (2) groups of people, (3) areas of social life and (4) economic sectors.

The differentiated gradual opening must take into account the strong interconnectedness of social areas, companies and sectors with each other. This limits the possibilities for meaningful differentiation. The attempt to centrally control the resumption of production would be of a planned economy nature and would not work in practice. This resumption must be controlled primarily by the institutions and companies themselves. The *task force* can only recommend general conditions and criteria.

Decisions on the differentiation of opening steps should be taken along the following criteria, taking into account the precautionary measures for health protection:

- Sectors with a low risk of infection, e.g. highly automated factories, and less vulnerable persons, e.g. day-care centres and schools, should be opened first;
- Complementarities between sectors must be taken into account. For example, many people with children cannot go to work when day-care centres and schools are closed;
- Sectors where home office and digital technologies can be used well have less priority than sectors where this is not possible;
- High value added, which characterizes, for instance, parts of the manufacturing sector, should be considered as a criterion for priority opening;
- Priority should be given to easing restrictions that imply high social or psychological stress;
- Regions with lower infection rates and less potential for spread can be opened up more easily;
- After the formation of natural immunity, especially areas and regions with high immunity can be open;
- Regions with free capacities in health care can be opened up more easily.

### c. Communication

A differentiated step-by-step plan is highly complex, and the feeling of threat among the population is very real. To win over the citizens, who find themselves in a critical situation, objective, consistent, convincing communication which is in line with our values is required. The communication should promote a sense of unity, and should be realistic and transparent. It must neither trivialise nor exaggerate risks.

It should also be communicated that a return to normality can most likely only be achieved in the long term and with significant effort and cost. However, the more differentiated, risk-adjusted and determined action is supported by the entire population and complemented by appropriate policy measures, the better it will succeed.

Workers in sectors to be opened must be ready to resume work. Above all, this requires sufficient confidence in the ongoing measures to combat the pandemic.

Plans for the gradual resumption of activity/production need to be available and communicated sufficiently early so that the actors concerned, such as companies and educational institutions, can start their own arrangements for re-opening. Without such preparations, a risk-adapted strategy cannot succeed.

The implementation of the strategy described here is undoubtedly challenging. Nevertheless, the tasks ahead can be taken up with confidence. Germany can rely on good conditions and strong resources and is well equipped to successfully overcome the corona pandemic.

*These recommendations are based on the state of scientific knowledge at the beginning of April 2020 and must of course be adapted immediately if new scientific findings indicate a change in the diagnostic and/or therapeutic approach to medical issues or corresponding changes in other sectors.*

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# 1 Introduction

The SARS-CoV-2 pandemic is confronting all countries with unprecedented problems: a newly emerged virus that has arrived to infect humans, and that spreads rapidly from person to person, causing relatively severe illness (COVID-19) in some patients, and that can be spread even before symptoms appear.

The rapid increase in the number of infected persons and - with a delay of about 2 weeks - in the number of seriously ill and, above all, fatalities, has led Germany as well as many other countries to decide on and implement far-reaching measures. These include strengthening the health care system and a very successful expansion of intensive care capacities. These also include measures to slow down the spread of the infection. Some of these restrictive measures deeply interfere with basic rights and include - with regional differences - contact restrictions, curfews of varying degree, as well as the closure of various businesses and the banning of events. The resulting extensive standstill of social and economic activity is also known as *shutdown*.

The current goal is to flatten the previously steeply rising curve of infection rates, avoid overburdening the health care system and thus reduce serious illnesses and deaths. The simultaneous expansion of capacities in intensive care medicine and its coordination should prepare for increasing numbers of COVID-19 patients. It is no longer intended and would probably not be realistic to stop the infection completely.

At the same time, however, these restrictive measures generate considerable costs, especially in psychological, social, economic and also medical terms. In addition to the immediately urgent measures to treat the sick and to prepare the health care system, and in addition to the fiscal and monetary policy measures to contain the economic damage caused by the current state of affairs, the further development must focus on one issue: taking into account the views and expertise of various sciences and the concerns of a wide range of social groups, policymakers must devise a strategy that combines the best possible protection of the population with the greatest possible resumption of their personal, social and economic activities.

The authors assume that it is not realistic, or at least not safe, to expect an effective vaccination or an acutely effective therapy against SARS-CoV-2 before 2021, even if such research and development work is given high priority. At the same time, all epidemiological models to date show that, especially if the infection curve is successfully flattened, the pandemic is likely to last not only many months but well into next year. This means that dealing with it will be much more like a marathon than a sprint.

In recent days, in view of the fight against the corona crisis and the far-reaching restriction of economic production associated with it, there has been repeated talk that economic interests currently have to take second place to the protection of life and health. The authors consider the idea that there is an irreconcilable conflict between medical care on the one hand and economic value creation on the other to be false and misleading. On the one hand, a positive

economic development is not possible if the virus spreads uncontrolled. On the other hand, the harmful effects of the current restrictive measures are not only about economic action - they are also about psychological and social impairments and deep interventions in basic freedoms.

Moreover, our existing health care system, which is apparently very resilient, also by international standards, can exist only on the basis of the high performance of our economy. Without this, it could not have been established, and without this it will not be able to exist in the long term. The task we face is not about the wrong alternative: medical care or economic productivity. Rather, it is about securing the economic basis of the medical and other infrastructure of our country in the short, medium and long term; at the same time it includes avoiding the devastating consequences that would result from a widespread standstill of large parts of the economy and public life for more than a few weeks, and preventing a pandemic with huge numbers of seriously ill and dead people.

In doing so, we need to broaden the virological-medical view of the pandemic to include other perspectives, which means in particular taking into account the costs and collateral damage caused by the current widespread standstill in public life. The associated damage goes far beyond mere economic and prosperity losses. Above all, the major social, medical and political costs of a longer *shutdown* must be taken into account. Therefore, the central concern of this paper is to identify ways out of the crisis which combine an optimal fight against the pandemic in a meaningful way with a further development of the current *shutdown* into a flexible strategy which is appropriate to the risks and can be sustained over the necessary periods of time.

## 2 Benefits and Costs of Restrictive Measures (*Shutdown*)

### 2.1 Necessity and Contribution to Contain the Pandemic

The restrictive measures adopted for Germany in March 2020 aim to flatten the infection curve and avoid overburdening the health care system by reducing social contacts and thereby reduce spreading the virus as far as possible. Similar measures in China and other Asian countries, but also during the first outbreak in Germany (Stockdorf near Munich), have apparently contributed to a far-reaching reduction in the spread of the virus. In view of the current conditions, however, the aim of the measures is no longer to stop the pandemic, but to slow it down. The measures are also intended to provide time to gain knowledge about the virus, its spread and the resulting diseases, and to develop strategies for further action and create capacities for this.

At present, the success of the measures cannot yet be estimated - mainly due to the latency between exposure and detectable infection and between detectable infection and illness or death. In particular, it is currently not possible to clarify which of the many measures will have what causal contribution to success. Currently, the number of infections is continuing to rise, which is likely to be helped by both the considerable expansion of tests and a real increase in the number of cases. However, this increase is beginning to level off and the doubling times are increasing, which can be seen as an indication of the success of the measures. The restrictions imposed in other countries also appear to be working: In Italy, it appears that the increase in infections in the north is slowly decreasing, but the numbers are increasing at an accelerated rate in southern Italy, which has been less affected so far. In most other European countries and on other continents, infection rates also continue to increase despite similar measures.

Finally, many critical parameters cannot yet be evaluated with sufficient certainty. This applies to the number of unreported cases (i.e. the proportion of undetected infections without symptoms), speed of spread (reproduction rate) and the severity of the diseases caused by them. These figures can currently only be roughly estimated and depend on the changing handling of the pandemic and other factors that may be influenced. For example, the contact behaviour of people, the intensity of testing, the medical care capacity but also environmental factors have an impact on these parameters. In view of what is known so far, it seems not unlikely that at least in Europe one or more waves of decreasing severity will occur over the next 1-2 years.

Data on the percentages of disease after infection vary between 50% and 80% of infected people, and on mortality between 0.1% and 10% of infected people. From Wuhan, the following figures are given: 80% of those who tested positive fell ill slightly or not at all, 15% fell seriously

ill and 5% of the cases were life-threatening. The real number of those who have had the infection - with or without symptoms - will only be determined with antibody tests that are not yet generally available.

If we assume that there is not a very high number of unreported cases and that about 70% of the population must have had the disease (and thus probably become immune to the virus), and if we continue to take the figures on severe cases from Wuhan as a basis, and if we finally reserve the entire current capacity of intensive care beds (about 30,000) for COVID-19 patients only for one week each (which is hardly realistic), then our health system would be able to cope with about 600,000 newly infected patients per week. This would mean two years for a 70% immunity in the population. Even if we hope for new therapies and for a vaccination (the latter with good reasons, despite various possible efficacy and safety problems, but very probably not before 2021), this rough calculation shows over which periods of time we might have to hold out.

In Europe, the Netherlands, Great Britain and Sweden had originally pursued the strategy of deliberately allowing the virus to spread in order to create a naturally acquired immunity in a large part of the population, which in turn should prevent further waves. Meanwhile, the UK and the Netherlands have moved away from this strategy under pressure from a sharp increase in severe cases, while Sweden continues to pursue it. This development needs to be carefully monitored and conclusions drawn.

## 2.2 Medical Costs

The current regulations mean a significant restriction of medical care for all non-COVID-19 patients. Many medical practices are closed, operations and diagnostic procedures are postponed, psychotherapy and physiotherapeutic care are hardly ever provided, care structures for the homeless and socially disadvantaged are largely shut down. Due to the requirement to avoid spatial proximity and residence in common rooms, medical care is often limited. In addition, operations and diagnostic procedures are postponed in order to have sufficient supply capacity for the treatment of COVID patients. The resulting medical damage is difficult to quantify, but is likely to grow exponentially with increasing duration and lead to significantly increased morbidity and mortality. Again, there are high-risk populations that suffer particularly from non-treatment: chronically ill and poor patients first and foremost.

Even if the current measures succeed in slowing down the pandemic considerably in order to spread the number of necessary intensive care treatments over a wider time frame, a one-sided preference for COVID-19 patients in the health care system by freeing up intensive care capacities and concentrating all treatment resources, including personnel, on this single clinical entity would correspondingly worsen the care of patients with all other diseases such as cancer, cardiovascular or autoimmune diseases. In order to avoid this and to be able to care for patients with COVID-19 and other patients equally and according to the same criteria, only a certain percentage of the resources of the health care system can be reserved for the care of

COVID-19 cases, which may have to be continually adapted to the situation. Both groups, COVID-19 cases and other treatments that cannot be postponed, would suffer equally from capacity bottlenecks.

According to current knowledge, people with pre-existing conditions are particularly at risk of suffering a severe and complicated course of COVID-19, especially in diabetes mellitus, kidney disease and chronic heart failure, and smokers. Another risk factor appears to be obesity. In general, people over the age of 65 are considered to be at risk and, for unknown reasons, mainly men. All these people should continue to receive continuous medical care now - also with regard to the risk of COVID-19 - in order to avoid disease progression to a state requiring artificial respiration. Public education measures and programmes to stop smoking as well as for weight reduction would be particularly profitable right now.

## 2.3 Costs in the Form of Lost Economic Activity

As a result of the restrictive measures, many companies cease production. One reason for this is that there are direct legal requirements to close down certain sectors. In other sectors, especially parts of industry, companies are closed down not because of direct government bans, but because of a lack of intermediate inputs or because companies want to protect their employees and their families from infection.

The ifo Institute has estimated the cost of the value added lost as a result of this for various scenarios where between 35 and 48 percent of production is shut down and recovery thereafter takes time. The cost is between 4.3 and 7.5 percent of GDP (approx. 150-260 billion euros) for a one-month *shutdown* and a subsequent gradual recovery of the economy. A *one-week* extension would increase the cost by 0.7-1.6 percent of GDP (25-57 billion euros). A three-month *shutdown* would have a cost of between 10 and 20.6 percent of GDP (354-729 billion euros). There is a risk of job losses and a sharp increase in short-time work. In the best (worst) case scenario, 160,000 (1.81 million) jobs subject to social security contributions and 180,000 (780,000) mini-jobs would be lost, and an additional 2.1 million employees (6.6 million) would be affected by short-time work. These costs alone justify virtually any amount of investment in health policy measures if this can shorten the duration of the *shutdown*.

Added to this are the costs of the lack of investment in education due to the closure of schools and universities and to a more difficult entry into the labour market for young people. Both of these factors have a considerable impact on equal opportunities. The interruption of (early) childhood education and care (day-care centres, kindergartens, facilities caring for people with disabilities) is also problematic both for the well-being and for the development of those affected, especially for children from disadvantaged backgrounds.

In addition, economic crises and unemployment have massive health and social costs in the form of increased physical and mental illness and reduced life expectancy of particularly af-

affected groups. The destabilisation of social structures that goes hand in hand with the economic and social costs can lead to massive damage both to affected individuals and to society as a whole, and may cause political instability in the medium term.

### 2.4 Social and Psychological Costs

The shutdown massively affects the psyche and the social life of all people. Currently, we are experiencing that many people are dealing with the situation in a very creative and altruistic way and that "physical distancing" does not lead to "social distancing". Some people feel that being thrown back on themselves and their families may be beneficial and may be a chance to reflect on what is important to them. However, it is to be expected that the psychological and social effects of the *shutdown* will become more negative the longer this state of affairs lasts. In addition, certain groups are particularly burdened, e.g. families with children, people in cramped housing conditions, people living alone, the sick and mentally unstable.

General consequences of contact and exit restrictions can be negative emotions such as anger, fear/ anxiety or feelings of loneliness, which have different effects depending on the personality. Conflicts between partners can intensify and escalate to domestic violence. Addictions to alcohol and drugs can increase. Anxiety and feelings of loneliness can lead to depression and even suicidal thoughts.

Especially in families, the consequences can be stress and overstraining, if during home office hours, the children's schoolwork has to be supervised and small children have to be taken care of. These experiences can in turn promote conflicts, aggression and violence.

The experience of an existential threat can cause people to slide into a self-reinforcing vicious circle of negative emotions. Further social consequences can refer, for example, to irrational "hamster purchases" - as an attempt to control a situation experienced as uncontrollable.

For homeless people, their plight is aggravated by the closure of support facilities without adequate alternatives being available. It affects those who are already among the most vulnerable. The same applies to people with high care needs, for example the disabled and the chronically ill. They all belong not only to the medical but also to the psychosocial risk group in the context of COVID-19.

Despite government support, too many people are losing their jobs or income from self-employment, or are very afraid of it as a result of the Corona crisis. Unemployment and the associated inability to provide for one's own livelihood and family is not only an economic burden for many people but also a considerable psychological burden, with all the health and social problems that this entails. In addition, people who are unable to work, and especially those in occupations that are not considered "systemically relevant", doubt the general meaning of their activity.

Furthermore, ideological radicalization ("they" are to blame) can take place in such situations and group conflicts can become stronger. For example, an intensified conflict between the

generations may emerge. Elderly people and those who have already fallen ill belong to the high-risk group for COVID-19 disease. Although young and healthy people can also become seriously ill and die from an infection, most do not consider themselves to be at high risk. The impression of paying a high personal "price" for the older generation can undermine the willingness to stand up for the elderly as society ages and may destabilize social interaction.

Moreover, if the announced government support does not reach all those affected, or if it does not reach them sufficiently or too late, confidence in the state may dwindle, which can strengthen divisive social forces and have serious political consequences. Social inequality can be exacerbated if, above all, those who are already socio-economically weaker are further weakened.

### 3 Structured Further Development Towards a Risk-Adapted Strategy

A further development of the current measures cannot mean to simply repeal them more or less quickly. In fact, if the current restrictions were to be lifted completely, the virus that is still present in Germany could once again spread very rapidly among the largely non-immune population and cause a large number of serious diseases. On the other hand, maintaining these measures in their present form would continue to have the negative consequences mentioned in the previous chapter, which would make long-term maintenance impossible.

Therefore, future measures must be designed and prepared in such a way that, on the one hand, they ensure good health care and, on the other hand, that they can be sustained over the necessary periods of time. We therefore recommend a **gradual transition to a risk-based strategy** that combines a relaxation of restrictions in the social and economic environment with continued effective health protection.

Planning for this transition must begin **immediately** in politics, administration, companies and other organisations, so that this further development can begin in the near future. A responsible easing of restrictions requires a carefully worked out strategy and extensive preparations, as does the further planning of health protection.

Strategies and experiences of other countries have to be analysed and relevant elements of these strategies have to be evaluated with regard to their feasibility in Germany. In addition, it is important for further decisions to assess the situation in Germany as accurately and continuously as possible. This concerns, among other things, reliable statistical information and model based analysis about the virus, its spread and health effects, but also on other negative consequences (costs and risks) of both a continuation of the current situation and alternative scenarios as listed in the previous chapter. This will require extensive monitoring.

### 3.1 Medical Elements

SARS-CoV-2 will continue to be present in Germany even during and after a possible phased lifting of the current initial and contact restrictions, and with a largely susceptible population and vaccination not foreseeable in the medium term, there is thus **a risk of a renewed wave of infection**. This cannot be completely prevented, but must be slowed down. This requires measures that (i) improve protection against new infections, (ii) identify and isolate infected persons quickly and as completely as possible and (iii) mitigate the course of the disease of infected persons as far as possible. This must be supplemented by a short and medium-term strengthening of intensive care medicine with overarching coordination of occupancy in order to provide the best possible care for even the most severe cases requiring ventilation.

In detail, this includes the following proposals:

#### (i) Protection of the population against infection

Although the spread of the pathogen cannot be prevented, it can probably be effectively contained by the widest possible use of **oronasal masks**. Even if these masks are not virus-tight, they can greatly reduce the likelihood of transmission by retaining droplets of symptomatically or asymptotically infected persons. Therefore, the production and distribution of masks must be immediately and massively increased.

Since equipment is not directly accessible to the entire population, priority must be given to health care facilities, nursing homes and homes for the elderly (staff and patients) in order to protect the risk groups in particular. At the same time, the supply of these sectors with **protective clothing** must be ensured; here too, production capacities must be greatly expanded. Even with a gradual relaxation of the curfew, the general hygiene recommendations (washing hands, coughing label, avoiding contact with signs of infection) must continue to be observed by the entire population - it is this observation that makes relaxation of the curfew possible in the first place.

Once the supply of masks to the health care system and nursing and old people's homes has been secured, the wearing of masks should be extended to the entire population. For a transitional period, until sufficient masks from professional production are available, the population can be provided with information on the independent production of effective masks. At least for all persons who come into contact with persons at risk, it should be introduced as compulsory for such contact (e.g. in care for the elderly). The Asian standard that a mask should be worn in public places for cold symptoms of any kind (i.e. also beyond corona infections) should also be propagated through information campaigns. Acutely, this means that intensive work should be done to eliminate the current supply bottlenecks for masks (and other protective clothing).

(ii) **Identification and isolation of infected persons and of persons who have already been infected**

Even with extensive protective measures, complete prevention of the virus spread cannot realistically be achieved. Therefore, testing for infectivity continues to play an important role. For this purpose, the currently available **test capacity** must be **greatly expanded** and supplemented by additional test procedures with high throughput and faster execution. These can be methods for the detection of antigens or virus genomes.

The detection of antibodies will be of considerable importance in the future for the analysis of the total number of persons who have undergone an infection and especially for the identification of persons immune to SARS-CoV-2, but does not help in the identification of acutely infectious persons, as antibodies only develop in the course of the infection.

For intensive testing in high-risk areas and also in the general population, it will be necessary to expand testing capacities considerably. It should be possible without major difficulties to carry out **screening outside accredited medical laboratories** but with fully validated and controlled methods. Veterinary institutions and public and private research institutes, for example, are suitable for this purpose and should be authorised to do so without delay. Positive tests generally require medical validation by an accredited laboratory. Since it will not be possible to carry out comprehensive testing even if the current testing capacity is greatly expanded, clear and simply defined criteria for testing must be established.

In addition to extensive testing in risk areas, broad testing of contact persons of infected persons and sentinel testing (i.e. testing for the purpose of providing information on the overall situation) of randomly selected, representative groups of persons should be carried out to assess the current number of infectious persons in the population. If medically justifiable, infectious individuals should be isolated in quarantine and otherwise admitted to hospital (preferably in staggered groups). Since infectivity may still exist 2 weeks after the onset of symptoms, a negative swab must be taken before the quarantine is lifted. Whether quarantine can be carried out at home or in newly created collection facilities with all its expected negative side effects should depend on the effectiveness of the current contact ban. Whether **electronic technologies** should also be used to ensure quarantine measures - as is the case in Korea and Hong Kong, for example - would have to be publicly debated and made legally secure.

In addition, **antibody detection** should be improved and made generally available as soon as possible. Antibody detection is important to prove that someone has gone through an infection and is now (most likely) immune. Such tests should, as soon as available, first and increasingly be used by personnel in the designated risk areas. This should be complemented by regular sentinel testing of the population for antibodies to find out the percentage of the population that is already immune. Consideration should be given to deploying these people mainly in risk areas (infection wards, care of the elderly and disabled people). If a curfew remains in place, these persons could be exempted from it by appropriate evidence.

There is a controversial discussion as to whether it might be useful, in the current phase of a relatively wide spread of viruses, to develop **modern technologies** that use technical aids such as smartphones to prevent infection in a legally compliant manner. Such technologies have helped to contain the pandemic in Asia by means of warning and contact tracing. Conceivable, for example, would be apps that allow smartphones to exchange information via Bluetooth contacts with the help of anonymised tokens that, if tested positive, would issue a warning to contact persons. The use of such apps, possibly combined with direct notification of test results via these apps, should in any case be voluntary. It could be made easier by facilitating curfews or contact bans. In any case, it must be designed in such a way that misuse is excluded and its use is compatible with our legal system.

### (iii) Mitigation of the course of the disease

Until direct antiviral drugs become available, uniform treatment regimens should be established by a commission of experts on the basis of worldwide experience and continuously updated according to the current status. The majority of infected patients have a mild and possibly even largely symptom-free course in quarantine without medical supervision. However, in a subgroup of patients with mild symptoms a rapid deterioration occurs in the further course of the disease, which must be detected early and treated as inpatients.

This could be achieved, for example, by the widespread introduction of apps to all COVID-19 outpatients, which require a questionnaire to be completed daily and are also connected to sensors that measure heart and respiratory rate, fever and oxygen saturation. The central collection of these data in appropriately secured systems allows the medical monitoring of a large number of patients with a reasonable number of personnel and could make it possible to admit high-risk patients at an early stage to hospital inpatient treatment in appropriately prepared hospitals that are familiar with the preliminary information.

Alternatively and more quickly available would be regular standardised contact with the family doctor or specially trained support staff, e.g. with daily telephone contact or by means of apps; this could be supplemented by the centrally organised distribution of pulse oximeters for monitoring lung function.

### (iv) Optimisation of inpatient care

Patients requiring inpatient treatment should be treated as far as possible in **regional reference centers** that offer the full spectrum of intensive care and that may be relieved of the burden of patients by other hospitals, since this is the only way to gain sufficient experience for optimal clinical care in these treatment teams, and since early detection of the need for ventilation and good intensive care therapy improve survival rates. If there are several hospitals in a region, it makes sense to set up special corona clinics, as this allows more efficient care of the patients concerned and at the same time protects the non-infected.

Since older multimorbid persons in particular require inpatient treatment, it must be ensured that they can be transferred to nursing homes or designated hospitals of a lower level of care

in good time, while maintaining hygiene standards, in order to reliably relieve the burden on the centres.

## 3.2 Organisational and Economic Elements

The resumption of economic and social activities cannot follow a rigid plan due to the many imponderables. The **risk-adapted strategy must be flexible so that** an appropriate response to new influences and changing requirements is possible. It is therefore advisable to establish a lean and tailored governance that ensures science-based support for policy from the perspectives of all relevant disciplines (infectiology, epidemiology, intensive care, economics, law (especially constitutional law), technical sciences, computer science, sociology, psychology, ethics and social work) (see Chapter 5).

Changeover scenarios have to be continuously assessed from various perspectives with regard to their feasibility. Over time, the available medical and epidemiological knowledge about the corona virus, its modes of spread and the disease it causes will increase, as will the understanding of which rules are effective and which, for example, are not followed by the population. Therefore, various **adaptations of the approach** may become **necessary**. In the course of time, the technical possibilities to accompany the risk-adapted strategy will improve (testing possibilities, availability of protective clothing and masks, ...). Today we do not know the timelines of these developments, but we must be able to effectively incorporate these new possibilities into our planning.

The **confidence of the population and the decision-makers in the economy in the** process and also their **cooperation** are crucial. A strategy-driven path that takes into account and balances the concerns of all social groups creates trust and enables balanced and informed decisions. Flexibility and risk-adaptivity in the transition from *shutdown* have the price of making planning more difficult for all parties involved, especially companies, and the risk of a loss of trust. Clear communication of the future strategy and ongoing stakeholder consultation can counteract this. Consideration should be given to cushioning the risks of this flexibility for private actors in particularly important areas. One example would be a government purchase guarantee when switching production processes to medical equipment (masks, protective clothing, respiratory equipment).

An important aspect in this context is that production capacities for future drugs and vaccines must be secured in Germany at an early stage. There is already a lack of capacity in vaccine research and production, and the current situation regarding masks and protective equipment shows that production capacity in our home country can be essential.

Various elements of the exit strategy (e.g. the use of smartphones to warn of infections and possibly also of infected persons or even personalised protection of vulnerable groups) must be **checked for their legal conformity** and, if necessary, feasible adjustments to the legal situation must be prepared. **The acceptance and compliance of rules and restrictions of**

**the population** must be continuously monitored and must be included in the evaluation of measures.

Compared with strategies pursued in Asia, it is questionable whether the control of infection chains and measures to contain the pandemic can be implemented in Germany with the same consistency as in the Far East. For example, there are different legal options for identifying and isolating infected persons. It is therefore necessary to implement own tailor-made measures which compensate for the presumably lower effectiveness of the infection-reducing measures. Among other things, this implies that special attention must be paid to the protection of vulnerable groups. This also applies to the assessment of whether a recent so-called "*hammer & dance*" strategy, i.e. strict social distancing followed by flexible relaxation, can be successful.

### 3.3 Step-By-Step Plan

It is recommended that the transition from the current situation to a risk-based strategy be gradual. Depending on current developments, further openings can be decided, postponed or, if necessary, reversed (the latter should, however, be avoided if possible). The management of this phased exit must be closely linked to the monitoring of the development of the pandemic and the health policy measures to contain it.

This change requires a very high capacity in testing for the virus - both in tests for acute infection (PCR) and for past infection (antibodies). These tests should be used to accompany the lifting of currently generally applicable bans (e.g. curfews) and can help decision-making as to who can be used where and how or can be "unlocked" at work and, if necessary, in public.

The following steps are elements of this changeover, which should be carried out step by step, if necessary, and always in compliance with the above-mentioned precautions (without the chronological order of the steps having to follow the order in this list):

- Social restrictions: In this area, initial restrictions may be lifted if appropriate protective measures are taken (distance, coughing etiquette, wearing of mouth and nose masks). Meetings of smaller groups with mouth/nose masks may follow, followed by further relaxation; strict measures should apply e.g. when visiting persons at risk.
- Health care economy: In addition to health care facilities, this includes the production of masks, vaccines, disinfectants, medicines and much more. These activities must be started quickly, because protective equipment is already lacking, and a new vaccine could at present not be produced quickly enough in sufficient quantities.
- The start of production in industrial enterprises and industry-related services should begin preferentially in companies whose failure cannot be bridged in the short term, and in those where the observance of distance between employees and of further hygiene and safety standards is readily feasible.

- Day care, nurseries, schools and universities: These areas may be reopened relatively quickly. Young people only rarely have severe symptoms, and schooling at home reduces educational equality and furthermore hinders parents from going to work. It should be clarified in advance on an individual basis whether there are people at risk, which would require appropriate precautions. In addition, online formats in educational institutions (e.g. universities) should be further developed so that they can continue to function if the pandemic flares up again. Parents are typically not in the risk group in terms of age, but may have risks due to previous illnesses, which must be clarified in advance.
- Culture, sports, events: A decisive parameter here is the size of the group - initially, only smaller groups should be allowed and close conglomerations should be avoided. Sports should be practiced primarily outdoors. The operation of playgrounds and sports fields can be quickly resumed if the distance rules and group sizes are observed.
- Hotels and restaurants: This area is particularly critical due to distance rules that are often difficult to enforce and the large and changing clientele. Opening can only be done very carefully and in a controlled manner.
- Travel and tourism: Here the consequences are currently difficult to assess, and infections may be spread over long distances. Opening should be done very carefully.

In any case, companies, particularly in the manufacturing sector, should immediately start to improve their hygiene standards in order to reduce the risk of infection. It should be examined whether standards from areas such as the food industry and health care institutions can serve as a guide. However, they should not be rigidly prescribed.

The easing of restrictions in the individual areas should take place gradually and not simultaneously; easing can also differentiate between groups of people, sectors and regions. The following steps and criteria should apply:

On the basis of expert assessments, an expected increase in infection rates (and especially an expected number of severe courses of infection) should first be estimated for the relaxation of restrictions. Depending on the development of the overall situation (infection rates, burden on hospitals, economic and social factors), further steps will be initiated or postponed. Certain fluctuations will hardly be avoidable. These adjustments as well as the individual measures taken must be communicated clearly and comprehensibly and be accompanied by a *task force* (see below).

For decisions on opening steps, the following criteria should apply in addition to the votes of the concerned institutions and companies:

#### **Differentiation by economic sector:**

- Basic infrastructures and sectors providing non-bridgeable goods and services (energy supply, food and other daily necessities) are open anyway. Their functionality must be ensured, additional hygiene standards are of central importance.

- Hygiene standards should be changed in all sectors where there is a risk of infection, following the example of standards in hospitals or the food industry and trade. Priority should be given to opening up where these standards are met.
- Sectors with a high risk of infection should remain closed for the time being, especially events with a large number of spectators, discos, clubs.
- Complementarities between sectors must be taken into account. For example, many people with children cannot go to work when day-care centres and schools are closed.
- Sectors where working from home and digital technologies can be used well have less priority than sectors where this is not possible.
- High value added, as is the case in particular in parts of the manufacturing sector, should be a criterion for priority opening (see table in annex).

Sectoral differentiation over time should focus on protection against infection and clear complementarities (such as in schools and day-care centres that enable parents to go to work).

Other of the criteria mentioned, such as differences in the level of value added or the degree of digitisation, should be taken into account, but can only be used to a limited extent to shape the opening process due to the strong interconnectedness of the sectors and companies among themselves. As the table in the annex shows, the value added of the sectors differs considerably both in terms of their overall economic importance and per person employed. It seems obvious to initially relax restrictions in sectors with high value added, such as manufacturing. However, selective resumption of production will then often fail due to the interconnectedness of the sectors. The attempt to centrally control the resumption of production in the closed-down sectors would have a planned economy character and would not work in practice. Instead, companies should receive government support when it comes to keeping cross-border value chains in particular functional or restoring them. In addition, additional support programmes for the introduction of digital technologies that enable production with reduced risks of infection should be set up quickly.

### **Differentiation by region:**

Although in principle uniform criteria simplify the procedure, strong regional differences may arise in the course of the pandemic. Such differences can also currently be seen in infection clusters, in the number of infections and in severe diseases. In line with such regional differences, different measures may also be appropriate. Examples are:

- Regions with low infection rates and lower risk of infection (rural vs. urban) and less potential for spread (remote vs. transport hub) are more likely to be opened.
- Regions with better health care can be opened up more easily.
- If immunity develops in the course of the pandemic, areas and regions with a high level of acquired immunity may be particularly open. Acquired immunity may, as illustrated above, also be an important criterion for assigning tasks to individuals.

### 3.4 Social and Psychological Elements

Politicians are always - but especially at the moment - in the situation of having to convince the population of the strategies adopted. An important element of a structured exit is therefore good persuasion. A number of criteria are important for this:

*Firstly*, persuasion for necessary measures works well,

- if the person communicating is considered credible and of integrity,
- if the message is clear, unambiguous and understandable,
- if the justification for the measure is comprehensible,
- if the communicating person also acts as a "role model", i.e. a person who aligns his or her own behaviour with the measures,
- if it becomes clear that the person communicating is guided by moral values (e.g. mutual willingness to help, also internationally).

Specifically, it would be desirable if politics could also agree on common approaches and common justifications on a federal level. This does not rule out regionally differentiated measures.

These considerations are particularly important if a phased plan with flexible transition scenarios is to be implemented. A (gradual, sectoral, personnel-differentiated) step-by-step plan is highly complex, and the population must be won over by means of factual, uniform, convincing communication that is in line with our value system.

A *second* important element is to maintain and promote a sense of "we". In crises, people stand together and make sure that they belong to their group or country. This "we" feeling can help people to realize that measures are not only for their own protection, but also for the protection of other people who are important to us. The willingness to undergo unpleasant measures is often increased when we know that this also benefits others who are important to us.

*Third*, risk communication should be realistic, i.e. neither trivialise nor exaggerate the risks. It should be made clear, however, that "*business as usual*", i.e. quickly returning to the way it was before the outbreak of the coronavirus, is not only potential self-harm in times of a pandemic, but also consciously accepts the harm to others and should be sanctioned accordingly. And risk communication should make it clear that it is possible to overcome the crisis, i.e. control convictions should be strengthened.

*Fourthly*, political leadership is particularly important in times of crisis, and how it is exercised is very important. Our democratic society has difficulty with strict prohibitions and restrictions on personal freedom. Political leadership must appeal to common values and emphasize moral standards (willingness to help, protection of the weak, partial renunciation, partial "sacrifice"). It should - see above - strengthen a sense of "we", but also emphasize solidarity within and between nations.

The role of the media should also be stressed in this context. They can help to provide realistic information and make the reasons for measures understandable.

With regard to each individual, it will be a matter of adjusting expectations to the given circumstances. In concrete terms, this means that it must be clear to each individual that fighting the virus will take a long time, that there will be phases with more or less threat, and that restrictions will occur again and again for specific times, specific groups, etc.

Since helping others usually also promotes one's own well-being, voluntary activities that help to fight the virus or mitigate its social consequences should be welcomed and supported.

## 4 Conditions for the Transition to a Risk-Adapted Strategy

### 4.1 Manageability

All measures should take into account the population's expectation that *all* seriously ill people receive adequate medical care, that the health system is not overburdened and that particularly vulnerable groups are protected. Ideally, the number of new infections and the number of people cured would be balanced.

Due to the latency - caused by the incubation period and the course of the disease - this point in time cannot and need not be waited for completely, but rather a departure from the exponential growth curve of the first week towards a stabilization of new cases with still existing reserves of inpatient and intensive medical care would be the appropriate time to start a gradual transition. At the same time, the prerequisites for effective protection of the most vulnerable groups (in addition to older people, e.g. the homeless) must be created and sufficiently communicated again and again.

The decisive criterion for overburdening the health care system is likely to be the availability of intensive care, which can reach organisational, material and, above all, personnel limits. Continuous monitoring of available capacities, mechanisms for distributing patients to free places in the country (or better still in Europe), and follow-up national and regional measures can help to keep within this limit (see appendix). However, it may happen that this capacity will be significantly exceeded both in case of a rapid progression of the infections and in case of a successful containment and the resulting long-term process.

A further objective that must be achieved at all costs - even if the current *shutdown is* maintained - is sufficient protection for (COVID-19) risk groups such as the elderly and disabled. Sufficient protection material is needed for their care, whatever further scenario is chosen during the pandemic and in an appropriate manner afterwards. In addition, there is a need to recruit sufficient personnel for these areas and to train them in hygiene and protection issues.

The treatment capacities are not a fixed size. They also depend in part on the organization of care. The dedicated establishment of entire hospitals as "corona clinics" in conurbations and thus the extensive separation of infected and non-infected persons increases the efficiency of care. Furthermore, many more seriously ill COVID-19 patients do not necessarily require invasive ventilation. In many cases, they can and should also be treated with non-invasive mask ventilation. This extends the range of possible ventilation devices. In particular, it can be clarified with the corresponding home ventilation organizations to what extent additional ventilators can be obtained from here.

## 4.2 Legal Assessment

Unlike other states, the Federal Republic of Germany is not in a formally declared legal state of emergency. Nor is there a state of emergency that is above the law. The current situation may be an hour of the executive, but it is not the hour of lawlessness or the annulment of central constitutional principles. Rather, all measures, both those already taken and those proposed or considered here, require democratic legitimacy and constitutional legality. The crisis must be combated within the framework of the normative provisions of the Basic Law and by means of the rule of law.

### 4.2.1 Admissibility and Proportionality of Restrictions on Freedom

The measures ordered so far, such as contact and curfew bans, assembly bans, closures of companies and shops and many other things, entail serious restrictions, sometimes even de facto suspensions of central basic rights for practically the entire population of the Federal Republic: for example, freedom of religion and freedom of assembly, freedom of occupation and property, freedom of movement and general freedom of movement. This is a unique and, until recently, unimaginable event, which shows that the corona crisis, which endangers the life and health of many people, has not only enormous economic and social costs, but also considerable "fundamental rights costs".

The admissibility of restrictions of fundamental rights is subject to the principle of proportionality. In concrete terms, this means that the state measures ordered must not merely pursue a legitimate objective, which they undoubtedly do in combating the corona pandemic. Furthermore, the measures taken to achieve this objective must also be appropriate, necessary and proportionate. This, in turn, implies the obligation for the authorities to constantly check whether partial or universal milder measures can be considered or whether partial relaxation or lifting of the bans can be carried out.

It would be too simple if the logic of maximum protection against infection were to be followed here alone. Rather, in addition to the massive restrictions on fundamental rights themselves, the overall balance must also take into account the indirect effects of the prohibition measures and their unintended side effects: the increase in domestic violence, increased self-endangerment, possibly a higher suicide rate due to social isolation, etc. (see under 2.4). There is no doubt that this is a very complex and presuppositional task, in which the state institutions will have to be granted a wide scope of assessment. The only decisive factor is that such an overall view must be taken and not the absolute imperative of the epidemiological police.

This central idea is the basis for the proposals put forward for the successive relaxation or withdrawal of the restrictions imposed and a corresponding phased plan (see point 3.3).

In the vast majority of cases, existing restrictions on fundamental rights are withdrawn in accordance with such a graduated plan. For some groups of people, however, there may also be more stringent interventions, for example if the idea of using mobile phone tracking or other

apps is considered. Irrespective of the technical feasibility and the exact design of such a procedure, which still needs to be clarified in detail, this option for action should not be taboo from the outset. Data protection is a high good and the right to informational self-determination is an important fundamental right, but it is not absolute and does not take precedence over other fundamental rights. On the contrary, like these, it can also be restricted under certain circumstances and for certain legitimate purposes. If, for the first time in living memory, no Easter services are held, then we can and must be able to consider a way - based on strict rules, of course - of restricting the spread of the pandemic by accessing mobile phone data.

#### 4.2.2 Differentiation by Sectors, Persons, Regions

Most of the measures taken so far have been rather general, undifferentiated and not very precise. Thus, the question arises whether the differentiation according to sectors, persons and regions proposed in this paper possibly constitutes an inadmissible unequal treatment and thus a violation of the principle of equality in Article 3 (1) of the German Constitution.

The answer is clearly negative. For differentiation is not only the order of the day, but also the answer required by the Constitution. If one differentiates according to groups of persons and regions in the case of bans on going out or contact, the closure of public institutions or shops, bans on assembly and worship, or the gradual relaxation of these measures, then this does not constitute a violation of the general principle of equality, but takes this into account. For at its core, the Basic Law's Law of Equality demands, in order to use a traditional legal formula: "Equal is equal, unequal is to be treated unequally". This maxim is the basic justification for the tax progression, according to which the tax rate increases in proportion to income.

Therefore, a different speed in the relaxation of restrictions based on objective criteria such as economic sectors, groups of persons or regions is not only constitutionally unobjectionable, but actually to be demanded.

### 4.3 Economic Conditions

It can be assumed that the economic costs in the form of lost value added increase not only linearly but disproportionately with the duration of the *shutdown*. As the duration increases, insolvencies and job losses increase, which places an increasing burden on the recovery after the end of the shutdown. At present, there is **no reliable evidence of a specific critical shutdown duration** after which costs rise sharply (e.g. destabilisation of the financial system). **However, the risk of such cost jumps increases with increasing duration.**

Plans for the gradual relaxation of production, possibly differentiated by sector and region, must be available and communicated sufficiently early to allow the actors concerned, in particular enterprises and educational institutions, to make their own arrangements for opening up. Without such preparations, a relaxation of the shutdown cannot have the desired effect.

**Employees** in the sectors to be opened **must be willing to resume work**. This requires, above all, sufficient confidence in the ongoing measures to contain the pandemic. Just as in the health sector, inadequate equipment discourages employees, so in other sectors they will stay at home if they do not feel safe. For people with children, the opening of day-care centres and schools is also an important prerequisite for being able to go back to work.

#### 4.4 Social and Societal Conditions

A distinction needs to be made here as to what conditions should be in place to ensure that a structural and risk-flexible transition from the current situation is successful; and what "collateral damage" should be avoided by relaxing the *shutdown* in favour of a risk-adapted strategy.

The conditions for this are set out in 3.4: good communication of measures by politicians; credible and honest political leadership; law enforcement agencies should be able to monitor compliance with measures; infringements must be sanctioned. Social acceptance should be asked again and again. Public media should be involved in the mediation process. Relevant voluntary commitment should be promoted (see 3.4). These prerequisites should be created even *before* a transition to a new strategy in order to be able to communicate and initiate these changes in a credible and effective manner.

Here too, the criterion of manageability applies on both sides. The aim of a transition to a new strategy is to prevent potential collateral damage, especially if the *shutdown* is too long: The increase in domestic violence must be prevented; educational opportunities for children must be given; especially children from socially disadvantaged groups must be given fair chances; psychological problems (depression, dependencies, anxiety states; suicide attempts) must remain treatable (there is already a lack of psychotherapists and long waiting periods for appropriate treatment); individual social groups must not be played off against each other and further political polarisations resulting from all these problems must be observed (cf. also 1.4).

## 5 Recommendations for a Risk-Adapted Strategy

The following objectives should be at the centre of political action in the current crisis situation, in accordance with the responsibility of politics to society as a whole

- To largely prevent the pathogen from spreading again rapidly, so that at the same time the natural immunity in the population slowly increases;
- Strengthen the health care system to ensure the best possible treatment for as many patients as possible - with COVID-19 as well as with other serious diseases;
- to protect groups at high risk for severe COVID-19 diseases;
- To avoid social and psychological hardship in the fight against the pandemic as far as possible;
- To make economic activities possible without taking unnecessary health risks;
- to limit encroachments on fundamental rights to what is necessary and proportionate in accordance with the principle of proportionality.
- In order to achieve these objectives, we recommend a gradual approach to the relaxation of current measures restricting freedom, based on the health, economic and social risks involved.

Our recommendations include

1. a proposal on how the implementation and further development of the risk-adapted strategy developed here should be organised, and
2. short and medium-term crisis management measures, which must be constantly adapted and supplemented in the light of developments and in line with our overall strategy.

### 5.1 National Corona Task Force

For the success of a strategy of gradual strategic easing of the shutdown, it is crucial that political decisions are accompanied by a comprehensive and effective process of continuous risk monitoring and assessment. This risk assessment must always include an assessment of whether the conditions are in place for starting and continuing certain measures in the context of the relaxation of restrictions. On the basis of these analyses, appropriate recommendations must be made to decision-makers in politics and the private sector.

We therefore recommend the establishment of a **National Task Force** based at the federal government and **Regional Task Forces**, which are to be set up at the level of the federal states. These *task forces* collect all relevant information from the various medical, social and economic sectors that is required for risk assessment with regard to the risk-adapted control of individual steps. The *National Task Force* has the task of bundling assessments and recommendations and of overall coordination. All *task forces* are in close contact with each other in the sense of a competence network (Competence Network Corona).

In order to have access to the necessary expertise, the *task forces* should address the relevant experts nationwide and win them over for participation in *task forces* at federal or state level. The *task forces* should represent the competencies required for risk assessment and evaluation. A wide range of expertise from science and from the relevant areas of society is required. This includes, for example, expertise in infectiology, epidemiology, intensive care medicine, economics, law (especially constitutional law), technical sciences, informatics, sociology, psychology, ethics and social work.

The task of the *Task Force* is to prepare the political decision-making process and make appropriate recommendations, and to monitor and evaluate the implementation of these decisions.

## 5.2 Measures

### Measures for health protection

The following precautions are to be taken within the framework of the risk-adapted strategy, with particular attention being paid to the protection of risk groups:

- Comprehensive information and training on the necessary hygiene measures;
- Broad information and binding specifications for the use of protective equipment (adapted according to risk areas);
- Coordinated, large-scale testing to monitor the spread of the pathogen and the increase in immunity in the population
- Restore comprehensive and unrestricted medical care to the population.

Individual measures are to be organised **urgently**:

- The massive increase in the production of protective clothing and masks in Germany;
- Securing production capacity for vaccines and drugs in Germany;
- The regional and supra-regional coordination of ventilation capacity, designation of priority centres and stabilisation of needs-based expansion;
- the establishment and expansion of an IT-based structure for coordination and strategic planning.

### Measures for society and the economy

Urgent action must be taken in the social field:

- To strengthen the capacity and expand funding opportunities for assistance/accompaniment for people from risk groups;
- To strengthen the capacity and expand funding opportunities for coping with psychological and social consequential damages of the above-mentioned restrictive measures (psychotherapeutic support, counselling services, educational support, etc.).

In principle, the following four criteria should be taken into account for gradual and risk-adjusted opening:

- Risk of infection with SARS-Cov-2;
- Risk of severe COVID-19 disease;
- Relevance of the respective area of the economy and social life;
- Possibility of imposing and maintaining safeguard measures.

The concrete measures can be differentiated according to (1) regions, (2) groups of people, (3) areas of social life and (4) economic sectors.

The differentiated gradual opening must take into account the strong interconnectedness of social areas, companies and sectors among themselves. This limits the possibilities for meaningful differentiation. The attempt to centrally control the resumption of production would be of a planned economy nature and would not work in practice. This resumption must be controlled primarily by the institutions and companies themselves. The *task force* can only recommend framework conditions and criteria here.

Decisions on the differentiation of opening steps should be based on the following criteria, taking into account the precautionary measures for health protection:

- Sectors with a low risk of infection, e.g. highly automated factories, and less vulnerable persons, e.g. day-care centres and schools, should be opened first;
- Complementarities between sectors must be taken into account. For example, many people with children cannot go to work when day-care centres and schools are closed;
- Sectors where working from home and digital technologies can be used well have less priority than sectors where this is not possible;
- High value added, as exists, for instance, in parts of the manufacturing sector, should be considered as a criterion for priority opening;
- Priority should be given to easing restrictions that imply high social or psychological stress;
- Regions with lower infection rates and less potential for spread can be opened up more easily;
- After the formation of natural immunity, especially areas and regions with high immunity can be opened;
- Regions with free capacities in health care can be opened up more easily.

### **Measures in the field of communication**

A differentiated step-by-step plan is highly complex and the feeling of threat among the population is very real. To win over the citizens, who see themselves in a critical situation, objective, uniform, convincing communication is required which is in line with our value system. The communication should promote a sense of unity, be realistic and transparent. It must neither trivialise nor exaggerate risks.

It should also be communicated that a return to normal can in all probability only be achieved in the long term and with significant effort and cost. However, the more differentiated, risk-adjusted and decisive action is supported by the entire population and complemented by appropriate policy measures, the better it will succeed

Workers in the sectors to be opened must be ready to resume work. Above all, this requires sufficient confidence in the ongoing measures to combat the pandemic.

Plans for the gradual resumption of activity/production must be available and communicated sufficiently early so that the actors concerned, such as companies and educational institutions, can start their own arrangements for opening up. Without such preparations, a risk-adapted strategy cannot have the desired effect.

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The implementation of the strategy described here is undoubtedly challenging. Nevertheless, the tasks ahead can be taken up with confidence. Germany can rely on good conditions and strong resources and is well equipped to successfully overcome the corona pandemic.

## 6 Annex

### Table of Value Added by Sector and Employed Persons

No.	WZ2008	Economic Structure	BWS 2017		Employed persons 2017		BWS per EWT
			billion euros	Share	in thousands	Share	(in €)
1	A	<b>Agriculture, forestry and fisheries</b>	27.0	0.92%	615	1.39%	43,870
2	01	Agriculture	23.1	0.79%	570	1.29%	40,565
3	02	Forestry	3.6	0.12%	40	0.09%	89,875
4	03	Fisheries	0.3	0.01%	5	0.01%	52,600
5	B through F	<b>Production industry</b>	890.5	30.47%	10654	24.08%	83,583
6	B through E	Manufacturing industry excluding construction	752.7	25.76%	8175	18.48%	92,078
7	B	mining and quarrying	4.3	0.15%	53	0.12%	80,415
8	C	manufacturing sector	667.2	22.83%	7594	17.16%	87,864
9	CA	H.v. food and beverages, tobacco processing	46.2	1.58%	934	2.11%	49,507
10	CB	H.v. Textiles, clothing, leather goods and footwear	7.7	0.26%	141	0.32%	54,560
11	CC	H.v. Wood products, paper and printed matter	25.3	0.86%	441	1.00%	57,290
12	16	H.v. Wood, wicker, basket and cork products (oh. Furniture)	6.9	0.24%	137	0.31%	50,314
13	17	H.v. Paper and paperboard and articles thereof	11.1	0.38%	145	0.33%	76,593
14	18	H.v. Printer's Digest, Multiplied by Sound, image and data carriers	7.3	0.25%	159	0.36%	45,698
15	CD	Coking plant and mineral oil processing	5.5	0.19%	18	0.04%	305,222
16	CE	H.v. chemical products	49.8	1.71%	359	0.81%	138,836
17	CF	H.v. pharmaceutical products	22.2	0.76%	127	0.29%	174,693
18	CG	H.v. Rubber, plastic, glassware, ceramics, etc.	47.5	1.63%	685	1.55%	69,384
19	22	H.v. Rubber and plastic products	29.8	1.02%	442	1.00%	67,455
20	23	H.v. Glass, glassware, ceramics, processed stone and earth	17.7	0.61%	243	0.55%	72,893
21	CH	Metal ore dressing and machining, H.v. metal products	77.0	2.63%	1185	2.68%	64,976

No.	WZ2008 Economic Structure	BWS 2017		Employed persons 2017		BWS per EWT	
		billion euros	Share	in thousands	Share	(in €)	
22	24	Metal production and processing	20.6	0.71%	267	0.60%	77,199
23	25	H.v. Metal products	56.4	1.93%	918	2.07%	61,422
24	CI	H.v. data processing equipment, electronic and optical products	40.5	1.39%	362	0.82%	112,003
25	CJ	H.v. electrical equipment	44.8	1.53%	495	1.12%	90,596
26	CK	Mechanical Engineering	102.9	3.52%	1156	2.61%	88,974
27	CL	Vehicle construction	156.0	5.34%	1030	2.33%	151,420
28	29	H.v. Motor vehicles and parts	138.4	4.73%	892	2.02%	155,113
29	30	Other vehicle construction	17.6	0.60%	138	0.31%	127,551
30	CM	H.v. Furniture and others. Goods; Rep. and Inst. v. Machines	41.8	1.43%	661	1.49%	63,218
31	31-32	H.v. Furniture and other goods	26.4	0.90%	412	0.93%	64,104
32	33	Rep. and installation of machines and equipment	15.4	0.53%	249	0.56%	61,751
33	D	Energy supply	50.5	1.73%	255	0.58%	198,216
34	E	Water supply, waste disposal, etc.	30.7	1.05%	273	0.62%	112,425
35	36	Water supply	5.5	0.19%	35	0.08%	156,914
36	37-39	Sewage and refuse disposal; recovery	25.2	0.86%	238	0.54%	105,882
37	F	Construction industry	137.8	4.71%	2479	5.60%	55,570
38	G to T	<b>Service areas</b>	2,004.9	68.60%	32979	74.53%	60,792
39	G to I	Trade, transport, hotels and restaurants	467.2	15.99%	10044	22.70%	46,511
40	G	Wholesale and retail trade; repair and maintenance of motor vehicles	292.6	10.01%	5929	13.40%	49,355
41	45	Sale, maintenance and repair of motor vehicles	47.3	1.62%	854	1.93%	55,335
42	46	Wholesale trade (not motor vehicle trade)	144.6	4.95%	1849	4.18%	78,193
43	47	Retail trade (not motor vehicle trade)	100.8	3.45%	3226	7.29%	31,244
44	H	Transport and storage	128.0	4.38%	2261	5.11%	56,609
45	49	Land transport and transport by pipeline	49.0	1.68%	924	2.09%	53,060
46	50	Shipping	6.2	0.21%	25	0.06%	249,640
47	51	Aviation	7.4	0.25%	68	0.15%	108,529

No.	WZ2008	Economic Structure	BWS 2017		Employed persons 2017		BWS per EWT
			billion euros	Share	in thousands	Share	(in €)
48	52	Storage, otherwise. Service provider for traffic	48.6	1.66%	739	1.67%	65,806
49	53	Postal, courier and express services	16.7	0.57%	505	1.14%	33,097
50	I	Hospitality industry	46.5	1.59%	1854	4.19%	25,102
51	J	Information and communication	134.0	4.59%	1283	2.90%	104,440
52	YES	Publishing, audiovisual and broadcasting	29.0	0.99%	311	0.70%	93,090
53	58	Publishing	14.6	0.50%	184	0.42%	79,402
54	59-60	Audiovisual and broadcasting	14.3	0.49%	127	0.29%	112,921
55	JB	Telecommunications	26.5	0.91%	114	0.26%	232,333
56	JC	IT and information service provider	78.6	2.69%	858	1.94%	91,562
57	K	Financial and insurance service providers	117.9	4.03%	1130	2.55%	104,293
58	64	Financial service provider	71.9	2.46%	627	1.42%	114,721
59	65	Insurance and pension funds	28.3	0.97%	158	0.36%	178,886
60	66	With financial and insurance services verb. Activities	17.7	0.60%	345	0.78%	51,180
61	L	Land and housing	308.6	10.56%	473	1.07%	652,376
62	M to N	Corporate service provider	334.9	11.46%	6139	13.87%	54,548
63	M	Freelance, scientific and technical service provider	186.8	6.39%	2848	6.44%	65,586
64	MA	Freelance and technical service providers	135.2	4.63%	2145	4.85%	63,031
65	69-70	Legal and tax consulting, management consulting	90.7	3.11%	1396	3.15%	65,004
66	71	Architecture and engineering offices; technical investigation	44.5	1.52%	749	1.69%	59,354
67	MB	Research and development	24.5	0.84%	218	0.49%	112,408
68	MC	Other freelance, scientific, technical service providers	27.1	0.93%	485	1.10%	55,839
69	73	Advertising and market research	13.0	0.44%	248	0.56%	52,427
70	74-75	Freelance, scientific, technical DL n.e.c., veterinary	14.1	0.48%	237	0.54%	59,409
71	N	Other business services	148.1	5.07%	3291	7.44%	44,996
72	77	Letting of movable property	47.0	1.61%	141	0.32%	333,191

## Monitoring the Capacities of the Health Care System



Das DIVI-IntensivRegister erfasste bundesweit am **31.03.2020** um 6:15 Uhr mit 814 Kliniken/Abteilungen (+86 zum Vortag) die intensivmedizinische Versorgung von Patientinnen und Patienten mit COVID-19.

Die Angaben entsprechen den individuellen Einschätzungen der intensivmedizinisch tätigen Ärztinnen und Ärzten. Bis zur vollständigen Abdeckung des gesamten Bundesgebiets können die Daten nur bedingt zur Handlungssteuerung bevölkerungsweiter Maßnahmen und Ressourcenentscheidungen genutzt werden.

Weitere Daten und Kartendarstellungen auch in regionaler Auflösung unter:

[www.divi.de/register/intensivregister](http://www.divi.de/register/intensivregister)

### Fallzahlen COVID-19

		Veränderung zum Vortag*	
<b>aktuell</b>	in intensivmedizinischer Behandlung	1.486	+268
	davon beatmet	1.189 (80%)	+238
<b>gesamt</b>	abgeschlossene Behandlungen	552	+139
	davon verstorben	158 (29%)	+55

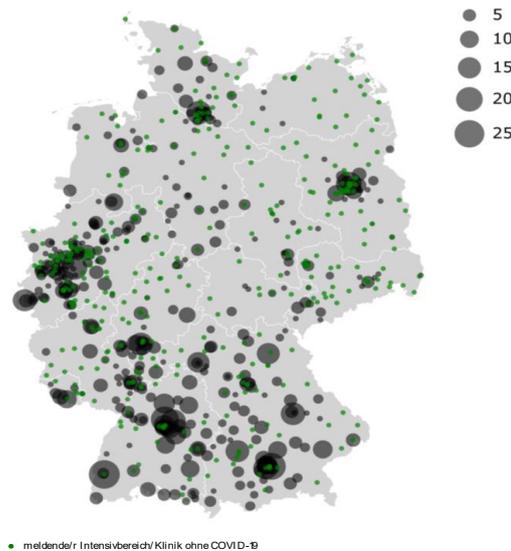
\* zu beachten die ggf. veränderte Anzahl berichtender Kliniken/Abteilungen

### Anzahl Intensivbetten

	Low care <sup>(1)</sup>	High care <sup>(2)</sup>	ECMO <sup>(3)</sup>	<b>Gesamt</b>	zum Vortag*
<b>belegt</b>	2.646	6.235	73	<b>8.954</b>	+1.251
<b>Aktuell frei</b>	2.408	4.583	374	<b>7.365</b>	+656
<b>maximal belegbar in 24h</b>	2.715	4.586	306	<b>7.607</b>	+807

- (1) Nicht-invasive Beatmung
- (2) Invasive Beatmung, Organersatztherapie
- (3) Extrakorporale Membranoxygenierung

### COVID-19-Fälle in Intensivbehandlung



### Kliniken und COVID-19-Fälle

