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CLINICAL FOCUS: MENS HEALTH
REVIEW

Men and COVID-19: the aftermath

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ABSTRACT

The global pandemic as a result of the SARS-CoV2 virus has seen over 16 m people infected and over 650,000 deaths, with men at double the risk of both developing the severe form of the disease and mortality. There are both biological (sex) and socio-cultural (gender) factors, compounded by socio-economic factors and ethnicity, that impact on the aftermath of what has occurred over the short time that this novel coronavirus has been circulating the world.

The potential life-long morbidity as a result of the infection and as a consequence of highly invasive critical care treatment needs to be factored into the rehabilitation of survivors. There are also many men whose lives will have been severely affected both physically and emotionally by the pandemic without ever contracting the disease, with the widespread disruption to normal existence and its impact on their social world and the economy. The implications of the closure of many healthcare services over the initial lockdown will also have both a shorter- and longer-term impact on other diseases due to missed early diagnosis and disrupted treatment regimes.

Getting effective public health messages out to the population is critical and this current pandemic is demonstrating that there needs to be a more focused view on men's health behavior. Without effective public support for preventative action, the more likely the disease will continue its path unabated.

This review explores the wider ramifications of the disease both for those men who have survived the disease and those that have been affected by the wider social effects of the pandemic. The pandemic should be a wake-up call for all involved in the planning and delivery of health and social care for the greater attention to the central role of sex and gender.

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Introduction

The current COVID-19 pandemic offers a prime example of how what we have come to know as 'men's health' is so much more than the biology of the reproductive system. Each disciplinary area will be focusing in on the implications of the disease but clinicians will also be seeing that the ramifications of the disease go beyond their own specialty. As we grapple with the numbers of men who have succumbed to severe illness and the high death rates the detailed exploration of the virus's pathophysiology is being accompanied by an equally exacting examination of the physical and emotional consequences of the disease and the social upheaval caused by the pandemic. With short, medium, and long-term effects that are going to play out across society that will have ramifications for the health and wellbeing of the population.

This paper seeks to give a broad overview of the possible bio-medical (sex) and socio-cultural (gender) implications of the pandemic on men. Although this paper has been written from the point of view of men, there is an equally important need to consider the enormous impact the virus has had on women [1–4]. There is now a worldwide effort being made to demonstrate the effect of the pandemic on women and men through such resources as GlobalHealth50/50 (https://globalhealth5050.org) and Gender & Covid-19 (https://www.genderandcovid-19.org). A key message is that there are important sex/gender public health implications of the disease as we move toward the next phases of this disease that have to be taken into consideration and become a more central part of forward planning for future pandemics.

At the time of writing this paper, late July 2020, there have been 16.34 m confirmed cases and 650,805 deaths [5]. Being male has been shown to be a particular risk factor for developing the severe form of the disease and mortality [2,6–10]. A modeling exercise on the possibility of developing severe COVID-19 as a result of underlying health conditions suggests that 6% (225 m) of the global male population may be at risk of requiring hospital admission if infected (3%/123 m females) [11]. In the over 70 years olds, an estimated 26% (52 m) males and 14% (35 m) females are at risk of hospitalization. Their work was based on an assumption that men are at twice the risk as women of developing the severe form of the disease and the higher prevalence of non-communicable diseases in men. COVID-19 is again showing how biological sex and socio-cultural

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gender differences are differentially impacting on men to create the conditions for the disease to take its deadly toll [4, 7, 8, 9].

Men's Risk of SARS-CoV2

How the disease affects the body is affected by the physiological environment of the individual this includes the underlying pathway the virus takes to invade the host cells, the reaction of the host to the virus, and co-morbidities that influence the impact of the disease – all of which can be seen to have marked biological sex differences [12]. These have been well described elsewhere [13, 14, 15, 16, 17, 18, 19]

Beyond the biological risk the epidemiological evidence of the spread of the disease is demonstrating that this is not an equal playing field, with marked intersectional differences seen in its impact based on different population groups [20]. Men's risk of developing and dying from SARS-CoV2 is markedly increased depending on their socio-economic status. In England and Wales, males in the least deprived areas have a death rate of 77.6 per 100,000 (44.3 per 100,00 for females) rising to 172 per 100,000 in the most deprived areas (97 per 100,000 for females) [21]. The disease has also been seen to hit those from nonwhite ethnicity harder [22,23]. Of the 10,075 patients who have been through intensive care in England, Wales and Northern Ireland by the 16 July 2020 4,654 were White ethnicity males and 2,411 were nonwhite ethnicity males [1,999 White ethnicity females, 1,004 non-White ethnicity females], which represents a higher proportion than seen within the overall demographics for the countries [24].

There is a strong link between poverty and the high levels of mortality in nonwhite ethnicities, representing 62% of all male patients in intensive care living in the lowest two quintiles of deprivation (as compared to 44.7% for White ethnicity) [24]. In an analysis into the clinical risk factors against demographic profiles for the first 5,683 deaths in England, the risk posed by deprivation and by race was not explained by higher rates of ill-health or other clinical risk factors, suggesting that it was more related to local social and environmental issues [25], such as living in crowded areas, poorer housing, a lack of accessible health care, and be employed in more risky settings [22, 26, 27, 28]. There are also higher levels of co-morbidity associated with the severe forms of the disease, such as cardiovascular disease, diabetes, and obesity in men of nonwhite ethnicity [23,29,30]. Such that the compounding of risk factors in most deprived communities may result in the negative aftermath of the pandemic also being borne by those with the least resources to manage [20]. But this does not explain all the vulnerability [31], and it is worrying to note that an early review of deaths in health-care workers in the UK found 94% of the deaths in doctors were male and that 94% of the deaths in medical staff were nonwhite ethnicity [32].

Men's Health Behavior

The pandemic is demonstrating that the different way men and women respond to public health messages and risk is an area that needs urgent consideration. This pandemic has hit at the core of most people's existence, creating for many an existential threat to their identity and their place in the world. Classic depictions of masculinity include notions of control, independence, power over others, pride, inner strength, competitiveness, success, and self-control [33,34], with a recognition of its dynamic nature, affected by personal, contextual, and cultural factors, but all of which impacted upon by the pandemic.

Getting men to change their behavior is a challenge with some studies suggesting that older men are less worried by the disease and more resistant to adopting preventative measures than younger men [35]. This may be due to better emotion-focused coping skills or a reduced perception of risk, which given the higher rate of death in older men is problematic. In a survey conducted by YouGov on British men and women found nearly a quarter of British men (24%) inaccurately believe coronavirus is 'just like the flu' compared with 16% of women. Similarly, they are also less inclined to believe official Government advice such as staying inside to stop the virus from spreading, with 10% saying this is false compared with 2% of women [36].

There are also signs that young men are also resistant to change, with a greater likelihood of breaking social distancing rules, with two-thirds of those fined in England and Wales for breaking lockdown were under 35 years of age and of those fined eight out of 10 were male [37]. The wearing of a mask has been now put forward as an important means of managing the spread of the disease, however there are reports that men are being put off by the effect it will have on their image. In a study of 1,266 males and 1,183 females in the USA on their willingness to wear a mask more men agreed that it would be shameful, not cool, a sign of weakness, and a stigma [38].

Similarly, hand hygiene has been found previously to be more thorough and performed more regularly by women as compared to men, both generally [39] and more specifically during the H1N1 outbreak [40] and the 2003 SARS epidemic [41]. Early indications suggest that this is the same finding for the current pandemic. In a study from China compared with males, females more frequently washed their hands (OR 2.39, 95% CI 1.85–3.09, P <.001) [42]. Other behavioral factors were also found in this study as women were more likely to: cover their nose and mouth when sneezing and coughing (OR 2.12, 95% CI 1.63–2.74, P < .001), keep social distance with others (OR 1.64, 95% CI 1.28–2.11, P < .001), stay home (OR 1.34, 95% CI 1.05–1.70, P = .02), avoid using public transportation (OR 2.30, 95% CI 1.72–3.07, P < .001), and clean frequently touched surfaces (OR 1.58, 95% CI 1.25–2.00, P < .001). Again, this can be linked to both a health awareness issue, but also one related to their sense of self: '[the disease] they can't fight back against, they look for some way to assert their masculine gender identity, in this case by proclaiming that they don't need to wash their hands, that they're tough enough to resist the disease without taking any steps.' [43]

Men tend to have higher levels of smoking globally [44], with its implications on NCDs such as cancer [45], CVD [46] and respiratory disease [47] well recognized. There have been welcome signs that in many countries the prevalence of smoking has been declining; however, this progress may have been

affected by the pandemic. There have been conflicting reports on whether either current or previous smoking behavior has contributed to COVID-19 risk. Some studies have suggested it has increased the risk [48, 49, 50], others that there is a relative absence of smokers from those with the severe form of the disease [48,51,52,53]. The overall consensus is that smoking is both associated with an increased risk of developing severe disease and death [54,55]. However, the conflicting advice may have contributed to an increased uptake of smoking. This is coupled with the emotional stress of the pandemic and also for many the loss of inhibitory factors such as smoke-free workplaces along with reduced access to smoking cessation services and vaping products [56,57,58].

Alcohol intake has also been a significant factor in men's higher risk of NCDs and wider physical and emotional health problems [59,60]. It is been suggested that there has been an overall reduction in consumption due to the closure of restaurants and bars as a result of the lockdown [61]. However, consumption has shifted to the home, which may have added to the increased reporting of domestic violence incidents [62]. Rhem and colleagues also warn that the changes that have been introduced with regard to policy changes to help give easier access to alcohol may not be reversed, increasing availability [61]. A further important factor is in regard to those who received support due to alcohol dependency may have regressed with loss of service provision [62].

Obesity has one of the most common morbidities seen in severe cases of SARS-CoV2, with 73.7% of patients admitted to intensive care in England, Wales and Northern Ireland having a BMI >25 [24]. Men have a higher proportion of their body fat as the more metabolically active visceral fat [63], which also has a more active role in leptin production and the inflammatory response through a higher ACE2 expression [64]. Visceral fat is associated with the metabolic syndrome and the development of Type II diabetes, which are also both highly implicated in severe forms of the virus infection [65,66]. Viral shedding is greater in obese patients, due to storage of the virus in adipose tissue, suggesting that there should be longer convalescence and social distancing [67]. [Extended virus shedding was also reported in men generally in a study from China [18]]. It will be important as we move forward to assess how the lockdown has impacted on food consumption and what public health initiatives can be supported to start to tackle the increasingly obesogenic male population.

Longer Term Health Implications for Men

According to the intensive care national audit and research center (ICNARC) as of the 17th July 4,133 males (1934 females) have been discharged alive from ICU in England, Wales, and Northern Ireland [24], these men and women may be expected to have life-long repercussions, both as a direct consequence of the disease and as a result of the intensive care experience they have endured. There will be layers of complex physical and emotional sequelae that may occur that pose severe long-term challenges to the man, his family, and the health and social care services.

The Post Intensive Care Syndrome is being highlighted as an important factor in those who have survived intensive therapy (Box 1).

Box 1. Post Intensive Care Syndrome (PICS) [68]
Cognitive impairments
Memory
Attention
Visuo-spatial
Psychomotor
Impulsivity
Psychiatric illness
Anxiety
Depression
Post-traumatic stress disorder
Physical impairments
Dyspnea/Impaired pulmonary function
Pain
Sexual dysfunction
Impaired exercise tolerance
Neuropathies
Muscle weakness/Paresis
Severe Fatigue

As many will have entered into their critical phase whilst already suffering from one or more co-morbidities, be more likely to be obese, and be elderly their rehabilitation will be more challenging [69,70]. One of the main features of the SARS-CoV2 virus is the complexity of the disease and the widespread effect it can have throughout the body. This can leave a legacy of health problems in survivors that goes beyond those seen in the SARS and the MERS epidemics [71].

To be expected, the virus infection is associated with extensive lung damage, especially in those that have developed the acute respiratory distress syndrome (ARDS) and acute lung injury (ALI), both of which have a high mortality rate. A Belgium study CT study of 216 confirmed COVID-19 patients, which involved the scoring of lung damage found that there were no differences between age or time from onset of the disease, but that men had more extensive lung damage (9.2 ± 5 versus 7.0 ± 4.8, $p = 0.001$) with a trend toward more bilateral lung involvement (89.3% versus 78.8%, $p = 0.06$) [72]. Even for those who do not go on to develop ARDS or ALI, there can be residual pathology, including alveolar damage and fibrosis that will compromise lung function in the longer term [73,74,75].

The disease has been noted as causing significant cardiovascular damage, through the exacerbation of existing cardiac morbidity and through the consequences of direct viral damage, acute thromboembolism, hypoxic injury, indirect injury as a result of inflammation, myocardial ischemia/infarction as a result of plaque rupture, and heart failure [76,77].

Recently, thyrotoxicosis, owing to a form of silent subacute thyroiditis, has been found in a group of COVID-19 patients referred to as High Intensive Care in a single-center study. Interestingly, about 70% of the patients were males, indicating that the male genetic background and the hormonal milieu (testosterone) might play a key role in this autoimmune disease, even though it is generally more frequent in females than in males [78].

There has also been significant neurological morbidity as a result of the virus, both as a result of direct neuro-invasion through the high ACE2 expression within the nervous system allowing the virus to cross the blood-brain barrier and direct entry via the olfactory bulb and vagus nerve [79,80]. The symptoms can include stroke, seizures, headache, dizziness, delirium, hypogeusia, and hyposmia [81,82,83]. There have also been 11 confirmed cases of Guillain-barre syndrome [83]. In a prospective study in Italy that explored subjective neurological symptoms (sNS) in 103 hospitalized patients 54 out of 59 men (91.5%) and 40 out of 44 women (90.9%) reported at least one sNS [84]. The most frequent symptoms were sleep impairment (51/103; 49.51%); dysgeusia (48/103; 46.60%), headache (40/103; 38.83%), hyposmia (40/103; 38.83%), and depression (39/103; 37.86%).

The neurological consequences of long-stay hospital admissions also have to be considered. These will include the possibility of polyneuropathy/myopathy [83] and the neurological damage that may have occurred as a result of cerebral hypoxia, including cognitive impairment, personality, and behavioral changes that can impact on a person's personality and ability to return to their prior lives [85,86].

There may be other long-term implications as a result of the impact of the virus on the gastrointestinal system [87] and renal damage [88,89]. Those patients coming through an intensive care experience may also be at risk of developing chronic pain, both as a consequence of the physically demanding nature of therapy and the potential neurological sequelae of the infection [90]. There is also the risk of Intensive care unit-acquired weakness (ICUAW), which can result in severe long-lasting disability [75]. In addition, fatigue is emerging as a particular problem, both for those who have milder forms of the disease and those who have had disease warranting intensive care treatment [91,92,93]. Although too soon to be formally diagnosed as chronic fatigue syndrome there are growing reports of symptoms similar to Myalgic encephalomyelitis (ME) as part of a post-viral response, with a similar picture to those seen in previous epidemics [94,95]. Debilitating levels of fatigue, which has a substantial impact on quality of life, is also found as part of the post-intensive care syndrome [96], and with the number of men who have had survived severe disease the numbers affected could be predicted to be substantial.

Reproductive Health

With ACE2 being highly expressed within the testes (both in the Ledig cells and in the seminiferous ducts), there is the potential risk of fertility being affected [97,98], which will need to be assessed, especially those that had an associated viral orchitis [88]. Nevertheless, although it has been reported that the previously existing coronavirus which causes severe acute respiratory syndrome (SARS), and other viruses such as HIV, HBV, and mumps enter into the testes and cause viral orchitis and perhaps even infertility [99], specific orchitis due to COVID 19 has yet to be observed. Also, too few studies, even those consisting of a low number of participants, have been carried out to evaluate the presence of SARS-CoV2 in seminal plasma. However, one study has found the virus in semen [100], whilst others [101,102] did not demonstrate any viral RNA material in the semen fluid, questioning the role of seminal fluid as a transmission route of that infection [103]. Of note, one study has suggested that the testes may act as a reservoir for the virus, adding to the delay in clearing the body of the disease [104].

In a study of the impact of SARS-CoV2 on the male sex hormones, 81 reproductive-aged infected men were compared to 100 control un-infected men. There was no statistically significant change in serum testosterone (T), however a significant increase was seen in serum luteinizing hormone (LH) and 'dramatically decreased' ratios in both T to LH and also follicle-stimulating hormone (FSH) to LH [105]. Suggesting that the virus may be having a direct gonadal influence.

Low testosterone has been linked to a higher risk of mortality generally [106] and more specifically in the H7N9 influenza epidemic [107] and has been suggested as a cause of severe disease and increased mortality in this current COVID-10 pandemic [108,110,111]. The measurement of testosterone levels is not routinely undertaken and therefore there is little empirical evidence of its impact, with currently only one small-scale study of 31 patients demonstrating an increased risk [108]. Such that this link remains mostly a hypothesis based on the already recognized negative effect of low testosterone on recognized preexisting morbidity such as epithelial dysfunction and cardiovascular disease, the risk of obesity; and the metabolic syndrome [109,112,113114]. There may also be an association with the immune response to the virus, through an association with increased pro-inflammatory cytokines [115]. Interestingly, an Italian study exploring the extent of COVID-19 in men undergoing prostate cancer therapy found those on androgen-deprivation therapy (ADT) had a lower risk of SARS-CoV2 than those not on ADT [116]. It has been suggested that greater attention should be made to the role of testosterone deficiency in the severity of the disease and the possible beneficial effect of phosphodiesterase type 5 (PDE5) inhibitors [12,117,118119].

Sexual behavior has been found to be altered during the pandemic, with a reduction in sexual desire and number of sexual partners during the lockdown, with a concomitant reduction in sexually transmitted infections as a result of anxiety, fear, boredom, and disappointment, coupled with the physical restrictions posed by closing down of movement [120,121]. Men in a study from China were found to have had a 53% decrease in the number of sexual partners (30% for females) and 32% of men and 39% of women experienced a reduction in sexual satisfaction [120]. The authors warn that there 32% of men and 18% of women reported that they would increase the number of sexual partners or risky sexual behaviors once the epidemic ends.

An online survey was conducted in the USA between April 10 to 10 May 2020 of 1,968 LGBTQ individuals, including 728 gay and bisexual men of the impact of COVID-19 on their sexual behavior [121]. For the gay and bisexual men, there was a marked change reported in their sexual behavior and partner selection, with nine out of ten having just one sexual partner or no sexual contact within the previous 30 days.

However, only 40% would disclose they had symptoms and as restrictions were easing with the authors note with concern that safeguarding strategies adopted during the lockdown may be stopping.

In recent years there has been welcome progress made on the management of HIV within the community. Two studies with gay men and men who have sex with men are showing that there were worries that the disruption in testing, prevention, and treatment services may start to see more men who have sex with men (MSM) vulnerable to increases in the disease [122,123].

Mental Health

In times of pandemics and other international and national pressure points, there has been a concomitant increase in reported mental health problems and suicide. In 2009, Mak et al [124] called the 2003 SARS epidemic a 'mental health catastrophe' due to the long-term psychological morbidity that followed. Their study, and others [124,125,126127] all reported high levels of persistent anxiety and depression, along with increased susceptibility to post-traumatic stress disorder. For those who required intensive therapy during the 2009 Influenza A(H1N1) pandemic at 1 year follow-up survivors were more likely to report psychiatric effects than matched control group. With those needing extracorporeal lung assist and those who did not need that level of support demonstrating severe anxiety symptoms (50% & 56%), with 28% in each group with severe depression symptoms, and five (41%) and 11 (44%) deemed at risk for PTSD [128].

Alongside the neuropsychiatric symptoms noted above, there is an increased risk that those who have been admitted to hospital will experience post-traumatic stress disorder (PTSD). Through both the overwhelming experience of critical care and a consequence of the fear of dying [68,70,71,129]. These studies were focused on survivors of the severe forms of the disease, but there are wider ramifications of the pandemic due to the social and economic impact threatening nearly every facet of an individual's existence [130,131].

The economic consequences and long-term financial insecurity as a result of the pandemic is far greater than seen in recent history, with previous economic depressions and recessions being shown to have a significant impact on the mental health of men and a marked rise in suicides [132133134]. There have also been reports of increased gambling [135,136], which may add to family's financial difficulties and have a negative effect on those under support for pathological gambling.

Studies that have explored time usage have demonstrated that the time spent on childcare and household activities is usually higher for women than it is for men [137], with men who are employed more often working full time, working longer hours and more likely to commute longer distances to work [138,139]. All of these factors will have been affected by the lockdown, closure of work, restrictions on travel and the high rates of job losses and the pending recession. For some men the pandemic has helped redefine their identity as a father, worker and as a partner, for others, it may have cemented existing patterns of behavior, built on notions of regaining control or defiance against a shifting social and economic backdrop. A very negative consequence of the pandemic has seen an increase in reports of domestic abuse and intimate partner violence [3], this has left both female and male victims with little opportunity to escape the perpetrator.

Male socialization and society's expectations on how boys and men are expected to manage their emotions can impact on the way they present mental and emotional difficulties [140141,142,143,144,145]. Men are more likely to externalize their difficulties, such as through anger, alcohol/substance abuse, increased risk taking as compared to women who are more likely to internalize and have signs and symptoms more associated with traditional diagnostic tools of anxiety and depression [140,146].

Tensions within the close confines of a house during the lockdown, with no means of escape may also precipitate a rise in separation and divorce as a result of relationship breakdown [147]. With the high death rate, there will also be an increase in men facing widowhood. The gendered impact on men's mental and physical health through social isolation and loneliness is being more widely reported on [148], with an increased risk of premature death, suicide, and worsening mental health.

Although the virus has not inflicted as widespread direct infection-related harm to many children and young adults as seen in older adults there may also be both shorter and longer term negative emotional health consequences to boys through their disrupted boyhood, stressful home events, fear, and lost education as a result of the lockdown [149]. Boys find it difficult to process stressful experiences and to express their emotions [150]. The enforced period of home confinement separating them from their friends and wider social world at a time when for many they were just gaining a sense of independence and self. Loss of school will also mean for many of the most vulnerable (including those who are gay, bisexual, drug users) the loss of critical services and a safe and nurturing environment resulting in a risk of increased depression, self-harm, attempted suicide [149,151]. For boys, there have also been warnings about the increase in male muscularity-orientated disordered eating and exercise [152].

Through the pandemic, there has been an unprecedented shutting down of nearly all competitive sport worldwide, with the concomitant loss of a key aspect of many men's lives. Both playing and spectating sport provides many men with both a mental and emotional release and is a key aspect of their social networking [153], what short and longer term impact this will have had on their health is yet to be seen, but for some it could be substantial.

Moukaddam [154], in a prescient article published just a month before COVID-19 emerged, explored the psychological impact of pandemics. He categorized these under three areas, all of which are emerging as the pandemic unfolds:

- New onset symptoms
- Adjustment/depression/anxiety versus well-defined post-infectious manifestations (such as post-measles subacute

sclerosing panencephalitis [SSPE] and Pediatric autoimmune neuropsychiatric disorders associated with Streptococcus infections [PANDAS])
- Worsening of existing conditions
- Exacerbation of existing mood, psychotic or addictive disorders
- Effect on caretakers and friends/family
- Depression/anxiety versus stigma, shaming

For those with existing mental health conditions, and for those whose mental health has deteriorated through the pandemic, the closure of general medical provision and psychological support services (including those for anorexia, self-harm, alcohol, and drug dependency services) will have left many very vulnerable to further deterioration. There has been a considerable effort to develop on-line and telephone support services, which may provide important short-term relief, but longer term planning for increase in demand in counseling and psychiatric service provision is needed [131,155].

It is important to also note the health and social care sector is working under enormous pressure, from those on the front line to researchers trying to find cures to those trying to coordinate stretched services. The mental health strain of the staff has been immense with already reports of staff succumbing to the stress, as was also seen during the previous pandemics [156].

Wider Health Effects

In the UK there has been a marked rise in deaths other than for COVID-19, as compared to the five year average for deaths at this time of year with male deaths exceeding female deaths in the younger years and a female excess in the over 80 years [157]. Some of these deaths may be as a result of COVID-19, but masked by other co-morbidities, but it may also be a consequence of people being unable, or unwilling, to seek medical help.

There has been a reported 57% reduction in Accident & Emergency visits in the UK comparing April 2020 to April 2019 [158], with 48% reduction in major A&E units. This may be a result of reduced need (such as fewer work-related and road traffic accidents, less pollution-related ill-health, fewer transmitted infections). However, the reports that the very quiet Accident & Emergency departments, clinics, and surgeries may also mean that many preventable deaths are being missed. There was reluctance seen in patients both for not willing to put extra strain on the services, but also through fear of contracting the virus whilst in clinical premises. Family doctors have had to find new ways of holding consultations, with many turning to phone calls and the use of Internet video – it will be important to see if there how these new services have been used by men and whether they have improved their health-seeking behavior.

There is also going to be a long-term consequence of missed appointments and treatment through the widespread closure of clinics, shutting down of screening programmes, canceling of routine operations, rapid emptying of hospitals to clear space for the feared influx of COVID-19 patients. An ONS report for England & Wales cites ischemic heart disease and other forms of circulatory disease, stroke, sepsis, meningitis, appendicitis, asthma, and diabetes as contributing to the excess deaths. The data is not yet sex-disaggregated, but with men having a greater risk of heavy impact disease [159] they are at particular risk. Reduced hospital capacity may also have a role to play as planned treatments were delayed and more men have life-limiting diseases in their younger years, such as cancer and cardiovascular disease [60,160], with warnings already being given of a 'cancer boom' [161].

Conclusion

What the current pandemic has revealed is that the world was not prepared to deal with such a new disease and we are in uncharted territory. Men's vulnerability demonstrates that there are biological as well as socio-cultural factors at play and whilst there have been a higher number of men getting the severe form of the SARs-CoV2 virus a greater proportion have not had it, but we are all affected by the pandemic.

With this being such a complex disease the aftermath for those who survived the severe disease will have to face a long rehabilitation, with many having life-changing morbidity, both physical and emotional. Few of those who have not had the disease will remain unaffected by the impact of the closure of much of society with the serious impact on the economy and on our social world. The emotional impact of the lockdown and the longer term emerging recession coupled with the complex grieving many will be experiencing will result in high mental health burden and increased rates of suicide in men.

Careful planning is now needed to get supportive measures in place for those who are our most vulnerable, especially as it is inevitable that this virus will be with us for many years to come. However, this work is hampered by the historical lack of policy focused onto men's wellbeing, such that the groundwork that is needed to reach out effectively to men has not been done [162,163]. We need a concerted effort to help men get onto the road to recovery both as a patient and also as a member of a locked down and deeply altered society.

Declaration of interest

The contents of the paper and the opinions expressed within are those of Alan White, and it was the decision of the Alan White to submit the manuscript for publication.

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