PSYCHOLOGY MISCELLANY

No.191 – October 2023

Covid Still (1st March - 30th September 2023)

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1. POLITICAL AND SOCIAL IMPACT OF COVID-19, WITH PARTICULAR REFERENCE TO THE USA

1.1. OVERVIEW

The year 2020 has been called "the year of disruption" (Katelle 2021 quoted in Redbird et al 2022) "as people, governments, and organisations wrestled with interwoven crises that threatened both lives and livelihoods" (Redbird et al 2022 p1). The response of governments to the pandemic interacted with social inequalities to produce a "patchwork pandemic" (Yong 2020 quoted in Redbird et al 2022), both across the world, and within countries. "Countries varied substantially in both pre-pandemic resources and government actions..., and the interaction generated substantial differences. For instance, countries in which citizens were more engaged in policy institutions responded with faster public health measures, such as testing programmes, business shutdowns, economic stimulus, and border closures; and experienced higher public co-operation" (Redbird et al 2022 p2).

Looking back at the pandemic, with particular reference to the USA, Redbird et al (2022) outlined a timeline with the following general phases:

a) Appearance of covid-19 - December 2019 in Wuhan, China, though later genomic tracing has suggested that "the SARS-CoV-2 virus existed, and was capable of binding with human cell receptors, for many years prior to the pandemic... That the virus was first noted in Wuhan does not exclude other possible geographies of origin" (Redbird et al 2022 p3).

b) Early outbreak - The virus arrived in different

countries at different times, but on the 11th March 2020 the World Health Organisation (WHO) declared covid-19 a pandemic. Lockdown and closure policies were introduced.

c) Pressure to reopen and subsequent waves of infection - From May 2020 demands to reopen society where there was lockdown, and then second waves of infection and so on in the rest of the year and into 2021.

d) The appearance of vaccines - Announcements of vaccines in December 2020, and the "race to vaccinate", especially in the richer countries, in 2021.

e) New variants - From mid-2021 onwards, variants of the virus started to dominate infections.

f) "Living with an endemic covid-19 virus" - The future?

In terms of the social and political impacts of covid-19, again with particular reference to the USA, Redbird et al (2022) highlighted three core themes (in the introduction to a special issue of the journal "RSF"):

i) Information - How it is consumed and shared.

ii) Inequality - Exacerbation of old ones (eg: racial-based), and creation of new ones (eg: "loneliness epidemic"; Klein 2020 quoted in Redbird et al 2022).

iii) Government responses - Not only the policies, but the trust in the institutions.

1.2. INFORMATION

The spread of health information among individuals is a way to control an infectious disease. Models of the spread of information have used the idea of "social contagion" (Page-Tan et al 2022).
Page-Tan et al (2022) explored the spread of information via "horizontal ties" (highly trusted, close contacts, like family), and "vertical ties" (formal organisations like the government) among a New York City sample in May and June 2020, and a larger, more representative US sample. Three changes in behaviour were the focus:

i) Stay at home and avoid public places - Around 80% of the New York sample had performed this behaviour. Overall, compliant individuals were more likely to have relied on information from horizontal and vertical ties.

ii) Using personal protective equipment, like face masks and gloves - Over 90% of the New Yorkers had changed their behaviour here. Such individuals were more likely to rely on information from vertical ties.

iii) Increased frequency of handwashing - Over 90% compliance, and linked to vertical ties as well.

Overall, information from official sources (vertical ties) were important (at least early in the pandemic), while horizontal ties also played a role in avoiding public places.

Leicht et al (2022) commented that "just when we needed experts, we ignored them or sent them packing" (p54). This was seen, for example, in the huge number of scientists who left government jobs in the first two years of Trump's presidency (over 1600) (Leicht et al 2022).

There was also an apparent "war on expertise" (Nichols 2017), and "a pseudo 'democratisation of knowledge' [Nichols 2017] where everyone's opinion is of equal value regardless of what the conveyor actually knows. Any suggestion of factual, scientific, or logical errors in an argument is met with a direct attack suggesting the critic is elitist, out of touch, or worse" (Leicht et al 2022 p54). So, as experts are "silenced", in comes misinformation ("false or inaccurate information circulating as a result of honest mistakes, negligence, or unconscious biases"; p56), and disinformation ("false information deliberately designed to deceive others"; p56) (Leicht et al 2022). There is also "fake news", which Lazar et al (2018) defined as "fabricated information that mimics legitimate news media content without a news organisation's process or intent" (quoted in Leicht et al 2022).

In this context, Leicht et al (2022) collected misinformation about covid-19 on Twitter and Facebook between 1st January 2020 and 31st March 2021. "Accuracy reminders" were attached to some of the posts, and the researchers explored this process. They explained that "contrary to popular belief, Facebook is doing a much more rigorous job of labelling misinformation than Twitter is. In fact, we could not detect how Twitter

labels misinformation, but our use of a common corpus of covid-19 misinformation sites suggests that Twitter does not challenge posts that Facebook does label..." (Leicht et al 2022 p62). in general attitude surveys in the USA, Facebook is mistrusted more than Twitter (Leicht et al 2022).

It was also found that Facebook's labelling a post as misinformation reduced the sharing of that information. "This result suggests that, at some level, labelling works as it is supposed to" (Leicht et al 2022 p63).

The researchers proposed two possible reasons for such labelling reducing sharing:

a) Presentation of the self - Individuals want to appear as "competent social actors" and sharing labelled misinformation could threaten that.

b) Impulsive versus thoughtful behaviour - The accuracy reminder "interrupts normal bias in cognitive functioning that might otherwise lead to the unreflective or lazy sharing of social media misinformation" (Leicht et al 2022 p63) (appendix 1A).

1.3. INEQUALITY

"With pressure on resources, resiliency, community connections, and, fundamentally, the health sector, the covid-19 pandemic has shone a bright light on how communities take care of themselves amid crisis" (Cohen et al 2022 p70). Cohen et al (2022) used the example of non-governmental community-based organisations (CBOs) in the San Francisco Bay Area in California. Data were collected via interviews with twenty-seven CBO staff between May 2020 and July 2021. Three overall themes emerged:

i) The centrality of health in/equity - Health inequities are "disparities in health that are preventable but have, unjustly, not been prevented", and they are linked to social determinants of health (ie: "factors outside the health sector that can affect health"; eg racism, housing) (Cohen et al 2022 p75). Health inequities existed before the pandemic, but these became "clearer" during covid-19.

ii) "Politics of care" - "Beyond responding to the immediate needs of the crisis, and in light of the

November 2020 elections, CBOs articulated their work as part of larger movements to demand the structural change necessary to advance health equity. CBOs have long offered blueprints for enacting care during crises that break from the reigning violent structures of capitalism, neoliberalism, and social hierarchies (such as racism, sexism, xenophobia). During the pandemic, they frequently combined responses to police violence against Black and Latinx people with attention to anti-Asian violence, and to the abandonment of the unhoused" (Cohen et al 2022 p77).

iii) "Rethinking 'crisis'" - The covid-19 pandemic crisis was in the context of many other crises, and "viewing it as both an extension and product of prior crises helps clarify why the pandemic has played out so unequally..." (Cohen et al 2022 p80).

Kamp Dush et al (2022) stated: "The effects of the pandemic were uneven with individuals racialised as non-White who already faced high levels of discrimination and structural racism experiencing a heavy toll" (p105). Using data from the "National Couples' Health and Time Study" (NCHAT), Kamp Dush et al (2022) investigated the stress of covid-19 and "racial trauma". The "minority stress model" (Meyer 1995) predicts that the experience of discrimination by "minority" individuals heightens the stress of other events (like the pandemic in this case).

The NCHAT was a nationally representative survey of 3642 US adults aged 20-60 who were married or cohabiting between September 2020 and April 2021. "Covid-19 stress" was measured by three items (eg: fear of being infected), while "racial trauma stress" was scored on a four-point scale in response to the question, "How has the recent movement for racial equity sparked by the killing of George Floyd influenced your stress?". Other measures included anxiety and depression, racial, sexual, and gender identity, income, social supports, and co-habitation/marriage duration.

After controlling for variables, covid-19 stress was higher among individuals who were not-White. However, statistical analysis showed that "covid-19 stress and racial trauma stress do not significantly interact and suggest that each source of stress has a unique association with mental health" (Kamp Dush et al 2022 p124). Also individuals not-heterosexual reported more covid-19 stress. The findings fit with the minority stress model. Social supports "emerged as key buffers of poorer mental health" (Kamp Dush et al 2022 p127).

1.3.1. Older Adults

Pezzia et al (2022) observed: "Older adults are at greater risk of covid-19 related mortality and health complications...; and the economic consequences of the pandemic have disproportionately fallen on lower-income groups... These combine to create unique circumstances for older adults with few financial resources — both because of their vulnerability and the increased economic precariousness of younger family members" (p88).

These researchers explored the impact of covid-19 on "a highly vulnerable population due to their age and socio-economic status" (Pezzia et al 2022 p90) via interviews with 90 low-income older adults (60 years and above) in Dallas, Texas, between June 2020 and May 2021.

Three types of disruption to their lives emerged from the data:

i) Social - Two-thirds of interviewees reported negative consequences for their social networks. "Negative changes included an increased state of worry and fear about catching the disease and possibly spreading it to loved ones, social isolation from stay-at-home orders, and decrease in social activity such that participants voiced concern that a physical toll was being taken on their bodies" (Pezzia et al 2022 p92).

Church attendance and funerals were particularly mentioned as disrupted.

Experiences were different depending on whether the individual lived alone or with younger relatives.

ii) Resources - Food assistance increased from government schemes and private sources, and the delivery method (eg: drive-through instead of walk-in) and make-up of packages (eg: more canned goods) changed.

Half the respondents reported difficulties paying bills, and the use of non-covid-19 health services declined (eg: dentistry).

iii) Institution - Applying for government benefits, like the Supplementary Nutrition Assistance Programme (SNAP) was streamlined, and the benefits increased, but many respondents were not aware of it. One interviewee said: "'I don't know why they make seniors jump through so many hoops. You need a college degree to fill out this paperwork, and even then you still don't know if you're doing it right' [paraphrase]. Even when able to complete the paperwork, several said that the hassle was not worth it for the low amount of benefits they

received..." (Pezzia et al 2022 p96).

Access to covid-19 vaccination was reported as challenging in terms of an appointment, or fear of long waits. One respondent stated: "I'm eighty-plus years old and have an incontinence problem. I can only go about twenty minutes before I need to use the restroom, and it's too hard for me to use one of those porta potty things. I need something closer to my house and where I can just go in get the shot and get out. I'll wait until I can get it at one of the pharmacies nearby" [paraphrase] (p97).

Pezzia et al (2022) saw the disruptions as having three dimensions of impact - temporal, poetical, and spiritual (based on the idea of "life-making" narratives from "narrative gerontology"; Randall and Kenyon 2004). The temporal dimension related to changing views on the future (eg: "feeling their age"), and feelings of losing control of life. The poetical dimension was meaning the individuals made in their life, and "the spiritual dimension reflects on the ways in which meaning, identity, and wisdom inform each other" (Pezzia et al 2022 p99). These two dimensions are seen, for example, in changes in how individuals viewed spending their retirement.

Pezzia et al (2022) ended: "For most study participants, modified or reduced social support, increased need for material resources, and changing institutions, programmes, and policies have created significant disruptions in their lives at an age when capacity for adaptation is diminished. However, our analysis of the spiritual dimension of narrative gerontology captures the ways in which older adult wisdom and experience can help us better understand key coping strategies emerging in the older adult population. These strategies will affect how older adults flourish or fail to flourish in the new normal" (p100).

1.3.2. Native Americans

Despite the increased vulnerability of Native American communities to covid-19 due to poverty, Evans et al (2022) presented a positive picture of "fewer covid-19 cases on tribal lands that had extensive networks of community-based and tribally controlled health facilities" (p136).

The initial picture of the pandemic was negative: "By August 2020, Native Americans nationally had 3.5

times more covid-19 cases and hospitalisation rates, five times higher than that of White Americans... Native American leaders highlighted the lack of co-ordinated and effective federal response to covid-19 on tribal lands. In Indian Country, federal relief packages were trapped in bureaucratic limbo as citizens in Native nations remained in fear of mass death" (Evans et al 2022 p137). But active involvement of Native Americans in their own government turned this around - for example, "Native Americans led all racial groups in the United States in covid-19 vaccinations through the summer of 2021... Tribal vaccination strategies included incentivising vaccination and creating partnerships with community organisations, IHS [Indian Health Service], and state governments to hold vaccination events. Many tribes converted their facilities — tribal offices, schools, casinos, urban Indian centres — into vaccination clinics and sites for drive-by and outdoor mass-vaccination events. The success of tribes' vaccination efforts was at least partially a result of their ability to determine their priorities in vaccinating their community members" (Evans et al 2022 p138).

The main argument of Evans et al (2022) was that "the presence of Native American legislators reduces covid-19 cases in Native communities..." (p138). This fits with "descriptive representation theory". "Descriptive representatives are those who look like, or at least have experiences and interests similar to, the people they represent" (Dovi 2007 quoted in Evans et al 2022). So, "having member legislators from diverse communities in legislative bodies leads to public policies benefiting members of those communities, often because they understand the needs of those constituents" (Evans et al 2022 p138).

Descriptive representation increases trust, and this was important in relation to covid-19 when large numbers of Americans generally did not trust federal government policy. Previous studies have found greater trust in government among African Americans in cities with Black mayors, and the same with Latinos and Latino mayors (Evans et al 2022).

In terms of data to support their argument, Evans et al (2022) looked at 333 Native American communities, their number of covid-19 cases up to June 2020, and the total number of Native American state representatives and senators in 2020. "In general, as the number of Native American legislators increases, covid-19 cases decline" (Evans et al 2022 p145).

1.4. GOVERNMENT RESPONSES

James et al (2022) considered the behaviour of US State governments in response to covid-19. Partisan divides based on the Republican and Democrat parties played a role, but it was not the whole story with intra-Republican conflict around support for Donald Trump also important.

"Public health officials in America's fifty states initially had limited knowledge of covid-19 and thus scrambled to understand and communicate its contagiousness and modes of spread and devise reasonable mitigation strategies and effective therapies. Federal experts in the CDC [Centres for Disease Control and Prevention] did offer guidance, but their messages were often disrupted or muted by the Trump administration..., leaving state governments to meld general federal guidance with their local context and preferences to determine appropriate responses to the pandemic" (James et al 2022 pp157-158).

Firstly, publication of covid-19 data varied by States, and this was linked to State-level infrastructure more than political position, argued James et al (2022). This conclusion was based on an analysis of the time between the first documented case of covid-19 in the USA (22nd January 2020) and the publication of State data online. The average time was eighty days, while the best States (eg: Virginia; Alaska) took 44 days.

Next, the researchers looked at long-term reopening plan after lockdown. Twenty-six States had published a plan by July 2020. James et al (2022) stated: "Contrary to expectation, we do not find any partisan or bureaucratic explanation for which states published long-term reopening plans" (p161). the researchers admitted that they did not evaluate the content of the plans, however, which probably varied by political affiliation.

The State mitigation responses to covid-19, which included mask mandates, and stay-at-home orders, were found to be linked to partisanship, both inter- and intra-party. For example: "Compared with Democratic governors, Republican governors facing Republican-dominated legislatures were 38 per cent less likely to implement a statewide mask mandate during the first seven months of the pandemic controlling for the severity of the covid cases in their state as of June [2020]...[] Republican-led states not only were less likely to have a mask mandate, when they did have one it was also significantly shorter than those in Democratically led states. On average, Republican governors imposed mandates

nearly three months (eighty-eight days) shorter than those of their Democratic counterparts" (James et al 2020 p164). There were also differences between "Pro-Trump" and "Trump-sceptic" Republican governors (eg: up to 100 days difference in length in mask mandates).

Another case of difference was vaccine mandates in 2021 (when Joe Biden was President). Twenty-six State legislators (22 with a Republican majority) rejected national government recommendations by limiting the power of public health officials to implement mandatory policies.

Not only is the government's response important, but the public trust about the response, and Pears and Sydnor (2022) asserted that "citizens' existing attitudes fundamentally shaped their assessment of whom to trust in the pandemic crisis environment" (p182). Three variables were found to be important here - partisanship, ideology, and State identity. However, there were nuances in the patterns of behaviour. For example, "[I]n July 2022, as long as the state had mask mandates and stay-at-home orders in effect, Democrats had more trust in their state to provide them with reliable information about the pandemic regardless of the governor's political party" (Pears and Sydnor 2022 p182).

Pears and Sydnor (2022) analysed data from over US adults who completed an online survey in late July 2020.

Suhay et al (2022) studied trust in the government over time using primarily data from the "Axios/Ipsos Coronavirus Poll", which surveyed a cross-section of Americans every week from 13th March 2020. Data up to 26th October were analysed (ie: 28 surveys).

Suhay et al (2022) summarised the findings thus: "we find evidence consistent with a vicious pandemic-era cycle of low trust, non-compliance, worsening health outcomes, and then even lower trust. In the United States, trust declined over time, which may have led some people to ignore the advice and directives of government authorities, worsening the pandemic. At the same time, our findings also suggest a counter-intuitive conclusion: low trust in the federal government specifically appears to have mitigated these negative effects to some degree, as it was those with greater trust in the branch of government headed by President Trump who complied less with expert-recommended health behaviours" (p222) (appendix 1B). A steeper decline in trust was observed among women, Black Americans, individuals with lower educational qualifications, and Republican supporters.

Government responses to covid-19 had impacts on other health policies and issues. Burns and Albrecht (2022) took the example of substance use disorder (SUD), which combined with covid-19 to produce a "syndemic" (Singer 2009). This is where there is more than one illness together; "each illness making the other more dangerous and their combination making mitigation more difficult" (Burns and Albrecht 2022 p245). "Assemblages" (Deleuze and Guattari 1987) is another term used (which referred to "complex systems of non-hierarchical interconnections between component parts, constituting a productive process"; Burns and Albrecht 2022 p246). Burns and Albrecht (2022) combined the terms as "a syndemic assemblage", which "has the capacity for compound harm that is greater than the sum of its component disorders and augmented through government or legal authority" (p246).

Concentrating on "small-town America", Burns and Albrecht (2022) explored how "the precarity of under-resourced social institutions" (p246) was worsened in the context of covid-19 mitigation demands (ie: the clash between covid-19 and SUD policies). Sandusky, Ohio, was studied via police reports, interviews with residents, and ethnographic data.

Nationally, a wave of overdose deaths can be seen during the covid-19 pandemic (classed as the fifth wave since 2000) (Burns and Albrecht 2022). Not only were local SUD services restricted during the pandemic, but mental health was impacted by stay-at-home orders and general uncertainty. "The results of these complications included a nationwide spike in overdose deaths followed by a new, higher, baseline of domestic overdose mortality" (Burns and Albrecht 2022 pp247-248).

This was seen in microcosm in the Sandusky area. For example, overdose calls to emergency services increased from 63 (pre-pandemic: March 2019 - January 2020) to 95 (during the pandemic: March 2020 - January 2021) (Burns and Albrecht 2022).

"The lives of the area's most vulnerable residents shifted from challenging to critical when economic uncertainty increased and vital social institutions shut down. Mental health deterioration at the community level, suicidal ideation increasing among adolescents, and problem substance use all fall under the heading of collectively enmeshed public health crises within the local area alongside the threat of the SARS-CoV-2 virus" (Burns and Albrecht 2022 p258).

In summary, the crises of SUD and covid-19 combined, and "thus made up a syndemic, creating unique

complications within the local, small-town context"
(Burns and Albrecht 2022 p258).

1.5. APPENDIX 1A — SOCIAL MEDIA

Zhang and Cozman (2022) observed: "As people
increasingly obtain and share risk information online,
social media adds another layer of complexity to the
situation. Publics [sic] may trust, gain and share risk
information from various channels, many of which may have
competing messages regarding the covid-19 risk, further
contributing to either amplification or attenuation of
risk" (p1). These researchers surveyed 394 US Twitter
users in February 2020 about this topic. Questions were
asked about their knowledge of covid-19 (before the first
case was reported in the USA), their risk perceptions and
perceived vulnerability, and trust in Twitter
information.
Overall, there was relatively little sharing of
information on social media about covid-19 at this time
(an attenuation of risk). "Findings also imply that (dis)
trust and misinformation concerns on social media
sources, and inconsistencies in early risk messaging may
have contributed to the attenuation of risk and low risk
knowledge among the US publics [sic] at the early stage
of the outbreak, further problematising subsequent risk
communication efforts" (Zhang and Cozman 2022 p1).

1.6. APPENDIX 1B - POPULISM

"A symbiotic relationship apparently exists between
populism and pandemic and Gugushvili et al [2020] note
'disease outbreaks can fuel populism, and populism can
fuel disease spread'. Populist-nationalist and
discriminatory politics exacerbate health inequalities
within and between nations. Anti-elite polemic erodes
opportunities to forge pro-active responses to pandemic
through the rejection of 'elite' medical expertise.
Global pandemics, such as covid, may strengthen populist-
nationalism particularly in restrictions on civil
liberties, freedom of movement, pathologising the
'polluting Other' through medical and vaccine nationalism
encouraging protectionism and border closures" (Bradford
and Cullen 2022 p161).
National political myths are important in populism.
"Political myths are ideologically and emotionally
significant narratives, collective acts of imagination

whose meaning is in part intended by their teller or
distributor. They are mobilised strategically to provide
an 'illusionary sense of protection' [Mineu 2009],
controlling meaning and framing stories, 'ownership' and
principles" (Bradford and Cullen 2022 pp161-162).

1.6.1. Populism and the Environment

In recent years, there has been a rise in
"authoritarian populism", which Ofstchage et al (2022)
defined as "a political perspective and hybrid set of
practices by which a leader or party seeks unchecked
political power through emotional appeals to the defence
of 'the people', land, and territory against an external
enemy" (p672). How does this approach view the
environment?
"Leaders who call on populist rhetoric often signal
the removal of environmental protections, denial of
climate change, violence toward environmentalists, and
the conflation of nature and nation. They favour big
development projects like dam building and river re-
routing that modernise landscapes while at the same time
preserving valued, so-called virgin landscapes.
Ultimately, authoritarian populists all share an
expressed attachment to and defence of 'the people', whom
they are protecting from various ills such as
cosmopolitanism, marginalised others, foreigners or other
outsiders, and activists who would impose distributive
goals over national strength" (Ofstchage et al 2022
pp673-674).
Ofstchage et al (2022) extracted three themes from
their review of the literature:

i) Governance - This refers to "political policies
and rhetoric that pertain to the use, conservation,
production, and trade of environmental resources"
(Ofstchage et al 2022 p673).
Populist leaders tend to support extraction
industries, prioritise economic development, and attack
environmentalist critics, all in the name of "the
people". For example, President Duterte in the
Philippines paid "rhetorical lip service to improving
mining-related environmental problems, reducing the power
of elites, and bolstering the livelihoods of fisherfolk
while enacting policies that favour extraction"
(Ofstchage et al 2022 p675).
The term "resource nationalism" can be used, "which
brings together authoritarian controls over production

and the populist protection of national prosperity"
(Ofstchage et al 2022 p675). Examples include the
development of Amazonia Brazil, copper mining in
Mongolia, and oil and gas extraction in Arctic Russia. In
the case of the latter, Graybill (2019) interviewed
inhabitants of Vladivostok, and one individual said that
"any climate change is good for Russia! It means greater
development in the north, which will assist us in
achieving our energy development goals, and then we will
be a truly global leader... When I am near a rig, I can
smell our power and I have hope — no, I know! — that
everything will be alright" (quoted in Ofstchage et al
2022). Graybill (2019) stated that "emotional narratives
about extractive development are created by an
authoritarian government and are reproduced by society
with strong emotions and affect" (quoted in Ofstchage et
al 2022).

ii) Representations - How the representations of
nature, ecology, and the environment are politicised, as
in climate change. "Political positions on resource
control draw on representations of nature intended to
demonise others, such as Brazilian President Bolsonaro's
decrying of indigenous and Afro-Brazilian territorial
claims as a waste of valuable resources" (Ofstchage et al
2022 p679).
A relevant concept is "sacrifice zones" (Edelman
2021), which can be economically abandoned regions, like
the "rust-belt" in the USA, that are available to exploit
for the benefits of national growth. The term can also
refer to people who can be discarded as in indigenous
peoples in Brazil. "Populist environmental governance
often rests on violence toward indigenous people and
workers as they impose control over territories and
ecologies" (Ofstchage et al 2022 p681).

iii) Resistance - The response of peasants and
indigenous people, for example, towards authoritarian
populism. This includes resistance and protest movements,
collective political coalitions, and alternatives that
work with the environment (eg: "mutualistic relations
with seeds, soils, and plants"; Rojas et al (2019)
describing peasant-led programmes in Brazil).

1.7. REFERENCES

Bradford, S & Cullen, F.J (2022) The advantages of chaos: Myth-
making and covid-19 in Hungary Populism 5, 157-183

Burns, A & Albrecht, K (2023) Localised syndemic assemblages: Covid-19, substance use disorder, and overdose risk in small-town America RSF: The Russell Sage Foundation Journal of the Social Sciences 8, 8, 245-262

Cohen, A.K et al (2022) "We keep each other safe": San Francisco Bay Area community-based organisations respond to enduring crises in the covid-19 era RSF: The Russell Sage Foundation Journal of the Social Sciences 8, 8, 70-87

Deleuze, G & Guattari, F (1987) A Thousand Plateaus: Capitalism and Schizophrenia Minneapolis: University of Minnesota Press

Dovi, S (2007) The Good Representative New York: Wiley-Blackwell

Edelman, M (2021) Hollowed out heartland, USA: How capital sacrificed communities and paved the way for authoritarian populism Journal of Rural Studies 82, 505-517

Evans, L.E et al (2022) Representative voices: Native American representation, political power, and covid-19 in US states RSF: The Russell Sage Foundation Journal of the Social Sciences 8, 8, 135-152

Graybill, J.K (2019) Emotional environments of energy extraction in Russia Annals of the American Association of Geographers 109, 2, 382-394

Gugushvili, A et al (2020) Votes, populism, and pandemics International Journal of Public Health 65, 6, 721-722

James, S et al (2022) Institutional capacities, partisan divisions, and federal tensions in US responses to the covid-19 pandemic RSF: The Russell Sage Foundation Journal of the Social Sciences 8, 8, 154-180

Kamp Dush, C.M et al (2022) Stress and mental health: A focus on covid-19 and racial trauma stress RSF: The Russell Sage Foundation Journal of the Social Sciences 8, 8, 104-134

Lazer, D et al (2018) The science of fake news: Addressing fake news requires and interdisciplinary effort Science 359, 1094-1096

Leicht, K.T et al (2022) The presentation of self in virtual life: Disinformation warnings and the spread of misinformation regarding covid-19 RSF: The Russell Sage Foundation Journal of the Social Sciences 8, 8, 52-68

Meyer, I.H (1995) Minority stress and mental health in gay men Journal of Health and Social Behaviour 36, 1, 38-56

Mineu, M.E (2009) Myth, rhetoric, and ideology in Eastern Europe education: Schools and citizenship in Hungary, Poland, and Romania European Education 41, 1, 55-78

Nichols, T (2017) The Death of Expertise: The Campaign Against Established Knowledge and Why It Matters Oxford: Oxford University Press

Ofstchage, A et al (2022) Contemporary populism and the environment Annual Review of Environment and Resources 47, 671-696

Page-Tan, C et al (2022) Information trust falls: The role of social networks and information during the covid-19 pandemic among suburbanites RSF: The Russell Sage Foundation Journal of the Social Sciences 8, 8, 32-51

Pears, E & Sydnor, E (2022) Covid-19 and the culture of American federalism RSF: The Russell Sage Foundation Journal of the Social Sciences 8, 8, 181-220

Pezzia, C et al (2022) Social, resource, and institution disruptions and the evolving lives of economically vulnerable older adults: Implications for policies and programmes in the new normal RSF: The Russell Sage Foundation Journal of the Social Sciences 8, 8, 88-103

Randall, W & Kenyon, G (2004) Time, story and wisdom: Emerging themes in narrative gerontology Canadian Journal of Aging 23, 4, 333-346

Redbird, B et al (2022) The social and political impact of the covid-19 pandemic: An introduction RSF: The Russell Sage Foundation Journal of the Social Sciences 8, 8, 1-29

Rojas, D et al (2019) Cultivating alternatives to authoritarian populism in Amazonia The Journal of Latin American and Caribbean Anthropology 24, 4, 958-981

Singer, M (2009) Introduction to Syndemics: A Critical Systems Approach to Public and Community Health New York: John Wiley & Sons

Suhay, E et al (2022) Americans' trust in government and health behaviours during the covid-19 pandemic RSF: The Russell Sage Foundation Journal of the Social Sciences 8, 8, 221-244

Zhang, X.A & Cozman, R.A (2022) Risk sharing on Twitter: Social amplification and attenuation of risk in the early stage of the covid-19 pandemic Computers in Human Behaviour 126, 106983

2. LONG COVID AND FATIGUE

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2.1. LONG COVID AND FATIGUE CONDITIONS

"Post-viral syndromes received little medical attention for decades, until the covid-19 pandemic triggered tens of millions of cases of long covid, leading to massive research effort" (The leader 2023 p5).
Neglect of chronic conditions, like post-viral syndromes, could well be related to the fact that the majority of sufferers are female, and middle-aged. "One can't help but suspect that there was some sexism, however inadvertent, in doctor's tendencies to dismiss symptoms as psychosomatic. Even today, people with autoimmune conditions like multiple sclerosis, which are also far more common in women, often wait months or years for a diagnosis" (The leader 2023 p5).

Long covid has increased the interest in other chronic conditions, like myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS). There is overlap between long covid and ME/CFS [1]. Davis et al (2021) reported that the most common symptoms of long covid at six months were fatigue, post-exertional malaise, and cognitive dysfunction. These are key symptoms of ME/CFS. Table 2.1 outlines six studies of long covid sufferers would could be diagnosed with ME/CFS. Note that the sample sizes varied as did the criteria for assessing ME/CFS (Jason and Dorri 2023).
Jason and Islam (2022) was extended to 480 English-speaking adults with long covid recruited via social media by Jason and Dorri (2023). Three questionnaires were completed:

a) DePaul Symptom Questionnaire-Covid (DSQ-Covid) - The frequency of 38 symptoms in the past month (from "none" (0) to "all of the time" (4)). Severity of the symptoms was also recorded.

b) DePaul Symptom Questionnaire-Short Form (DSQ-SF) - Fourteen symptoms common to ME/CFS.

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[1] ME/CFS also overlaps with fibromyalgia (eg: Ramirez-Morales et al 2022).

STUDY	SAMPLE SIZE (LONG COVID)	MEETING ME/CFS CRITERIA (%)	ME/CFS CRITERIA
Jason & Islam (2022)	299 (online)	49	Canadian Consensus
Bonilla et al (2023)	140 (Stanford Post-Acute Covid-19 Syndrome (PACS) clinic)	43	Institute of Medicine
Twomey et al (2021)	213 (online)	58.7	Post-exertional malaise
Mancini et al (2021)	41 (US patients)	46	Life Spheres
Kedor et al (2022)	42 (Charite Fatigue Centre, Germany)	45	Canadian Consensus
Gonzalez-Hermosillo et al (2021)	130 (Mexico City hospital patients)	13	Institute of Medicine

Table 2.1 - Six studies of long covid and ME/CFS.

c) DePaul Post-Exertional Malaise (PEM) Questionnaire (DSQ-PEM) - Five items rated for frequency in the past six months (eg: "A dead, heavy feeling after exercise"; ""Physically drained after mild activity").

Overall, 58% of respondents met the Canadian Consensus Criteria (CCC) for ME/CFS. These individuals as a group had significantly higher mean scores for every symptom on the DSQ-Covid (with only two non-statistically significant), on the DSQ-SF, and the PEM items. Jason and Dorri (2023) concluded: "This study confirms prior research showing that a substantial percentage of people who contract covid-19 develop a condition that meets the criteria for a CCC diagnosis of ME/CFS" (p8).
The study sample was volunteers recruited via covid-19 and long covid social media groups, and the majority were female, and White. The data were self-reports.

Nehme et al (2022) reported data from March to December 2020 from Geneva University Hospital on all individuals tested for SARS-CoV-2, and followed-up over six months later (over 5000 individuals). Fatigue at six months was measured by three different questionnaires. There were 1497 individuals who tested positive for SARS-CoV-2. Of this group, 17.2% reported fatigue, 8.2% PEM, and 1.1% met the criteria for ME/CFS (compared to 8.9%, 3.5%, and 0.5% respectively for the SARS-CoV-2-negative

group).

Salari et al (2022) calculated a prevalence of 45.2% for CFS four weeks after onset of covid-19 symptoms in their meta-analysis of fifty-two studies. This meta-analysis included studies published up to April 2022, and there was great variety among the studies in terms of methodology and findings. Most importantly, different definitions and criteria of chronic fatigue and CFS were used. Salari et al (2022) claimed to be the first systematic review of global prevalence of CFS in long covid patients. But only the four-week threshold was used for long covid.

A number of survivors of SARS in the early 2000s subsequently developed ME/CFS symptoms (eg: around one-quarter in Hong Kong over four years; Lam et al 2009), while H1N1 influenza A infection survivors in Norway in 2009 had a twofold increased risk of ME/CFS (Magnus et al 2015).

The overlap between covid-19 and ME/CFS would fit with the view that ME/CFS is triggered by a viral infection. One candidate is the human betaherpesvirus 6B (HHV-6B) which causes mild illness (Lee et al 2021) (table 2.2). Kasimir et al (2022) discovered HHV-6B in the post-mortem tissue samples of three individuals diagnosed with ME/CFS (Marshall 2023).

- There are inconsistent reports of herpesvirus infection and ME/CFS. "This may be due partly to small sample sizes in some studies, and to heterogeneity within and between ME/CFS populations included in different studies" (Lee et al 2021 p2).

- Lee et al (2021) argued that it is the reactivation of the latent herpesvirus that is the problem. In their UK and Canadian study, saliva samples were collected once a month for six months to analyse for the herpesvirus from thirty individuals with ME/CFS and fourteen healthy controls. "Participants with ME/CFS could be broadly separated into two groups: one group displayed fluctuating patterns of herpesviruses detectable across the 6 months while the second group displayed more stable viral presentation. In the first group, there was positive correlation between HHV-6B and HHV-7 viral load and severity of symptom scores, including pain, neurocognition, and autonomic dysfunction" (Lee et al 2021 p1).

Table 2.2 - Herpesvirus as a trigger of ME/CFS.

Simani et al (2021) analysed data on 120 covid-19 hospitalised patients in February-April 2020 in Tehran, Iran. Six months after discharge, they were assessed for ME/CFS-like symptoms, persistent fatigue, and post-traumatic stress disorder (PTSD). The prevalence of fatigue symptoms was 17.5%, and 14% for ME/CFS criteria, while PTSD was 5.8%. There was no association between ME/CFS and PTSD.

Oka (2023) reported a case of a 55 year-old woman in Japan who developed long covid that persisted beyond six months and recovered with treatment of the fatigue symptoms. She was diagnosed with ME/CFS using the Canadian Consensus Criteria.

Oka (2023) described the fatigue symptoms: "Severe fatigue at rest and PEM, even after minimal physical or mental exertion; she spent more than 50% of the day in bed. After physical exertion such as going to the supermarket, she became bedridden for several hours to days. After mental exertion such as paperwork for retirement, she had difficulty concentrating and understanding
and had to read the same sentence repeatedly" (pp2-3).

Twenty-one weeks of treatment and she was able to return to work as a nurse. The treatment had four strands:

a) Instructions on eating habits (ie: vegetable-based diet) and use of supplements (ie: ascorbic acid).

b) Cognitive Behavioural Therapy for coping with fatigue. Oka (2023) explained: "It was emphasised that fatigue is not something to overcome but rather to be managed by resting 'not when' she became fatigued but 'before' she started feeling fatigue (or worsening of fatigue), in order to live with a limited amount of energy. Second, the importance of reducing the repetition of negative thoughts, worry, and self-blame, ie: 'idling', in order to avoid cognitive fatigue was emphasised. Third, she was encouraged to increase her ability to be aware of her threshold for exhaustion or PEM and to attain the habit of 'listening to her body', eg: by recording in an 'energy-saving passbook' and writing in a 'fever-fatigue diary'" (pp5-6).

c) Gentle exercising based on the advice, "Do such exercises (types and duration) that result in your feeling pleasantly fatigued during and after them, just as you felt when you were healthy. However, avoid such

exercises (types and duration) that result in your feeling unwell during and after them" (Oka 2023 p6).

d) Amitriptyline (anti-depressant) and hochuekkito (Japanese herbal medicine).

Oka (2023) admitted that "it is not possible to identify which elements of the prescribed regimen were the most effective for her recovery. Although the treatments seem to have worked synergistically, further studies are necessary" (p6).

2.2. FATIGUE

Fatigue has a point prevalence of over one-third (Fatt et al 2019). It can be "both a transient accompaniment of everyday challenges and a pervasive symptom in a myriad of diseases, ranging from infective, autoimmune and even malignant disorders, to psychiatric conditions such as major depression, in which psychomotor slowing and fatigue are diagnostic features. In these conditions, symptomatic complaints of both physical fatigue (ie: difficulty achieving motor tasks) and mental fatigue (ie: difficulty achieving cognitive tasks) are reported. Fatigue is therefore a complex symptom, incorporating perceptions of weakness and slowness, as well as increased effort to achieve normal physical and mental performance" (Fatt et al 2019 p1).
"It is generally agreed that the sensation of fatigue (1) can involve difficulty in initiating activity and/or in sustaining activity; (2) can occur with physical activity, mental activity, and/or emotional activity; (3) is a diminished ability to perform an activity despite the of motivation to do so; and (4) can involve the perception that the effort required to perform an activity is more than is required" (Raizen et al 2023 p2).

Fatigue can be distinguished from fatigability. The former is "an internal state that is self-reported. Fatigability refers to decrements in motor or cognitive performance over time. Fatigability may reflect the balance between utilisation and restoration of energy resources, that may not correspond to the self-reported sensation of fatigue" (Raizen et al 2023 p2).
Fatigability is associated with the inability to continue physical activity. "Fatigue and fatigability resulting from high levels of physical performance are

adaptive responses that protects the body from
consequences of over-exertion such as muscle cell injury,
or deterioration of vital homeostatic functions (eg:
maintenance of cardiac output, blood oxygenation,
temperature)" (Raizen et al 2023 pp2-3).

Sleep and rest are the appropriate responses. So
this means that sleep disruption is associated with
fatigue, though sleepiness and fatigue can be different.
"Athletes after extreme exertion can be physically
fatigued, but not sleepy" (Raizen et al 2023 p3).

In relation to physical illness, fatigue is a common
symptom of cancer. "Cancer-related fatigue" (CRF) is "a
distressing, persistent, subjective sense of physical,
emotional, and/or cognitive tiredness or exhaustion
related to cancer or cancer treatment that is not
proportional to recent activity and interferes with usual
functioning. Compared with fatigue experienced by healthy
individuals, CRF is more severe, more distressing, and
less likely to be relieved by rest" (Berger et al 2020
quoted in Raizen et al 2023).

"Medically unexplained, debilitating fatigue that
persists for 1 to 6 months is defined as prolonged
fatigue" (Fatt et al 2019 p2). Estimates suggest that
around one-fifth of the general population suffer with
this (Fatt et al 2019). When the fatigue persists for
longer than six months, but there are no other symptoms
associated with ME/CFS, the term "chronic fatigue" is
used (Fatt et al 2019).

Fatt et al (2019) performed a review of the
literature on prolonged and chronic fatigue versus
ME/CFS. Twelve articles published between 1994 and 2018
were relevant. The lack of research comparing sufferers
with the different fatigue-related conditions stood out.

Here are the main differences that the researchers
could extract:

a) "Participants with prolonged fatigue were more
likely to be employed and spend more hours on meaningful
activity than those with chronic fatigue, as well as
those with ME/CFS. There were no differences between
those with prolonged fatigue, chronic fatigue and ME/CFS
for hours spent on other activities such as schooling,
hobbies and volunteer work" (Fatt et al 2019 p5).

b) The prolonged fatigue group was more
heterogeneous.

c) Chronic fatigue patients had higher self-reported

psychological distress, and functional impairment scores than healthy controls.

d) The nature of symptoms reported by chronic fatigue sufferers was very similar to individuals with ME/CFS (eg: anxiety and depression scores; cognitive performance), but the latter reported greater severity of symptoms (eg: physical health measures; functional impairment).

In terms of longitudinal understanding of fatigue, work on "post-infection fatigue syndrome" (PIFS) has helped, with its development "most consistently predicted by the severity of symptoms during the acute illness rather than by demographic, psychological/psychiatric or microbiological factors" (Fatt et al 2019 p6). Fatt et al (2019) reported a reanalysis of the data from the "Dubbo Infection Outcomes Study" (DIOS) of nearly 500 individuals with PIFS to show three trajectories at six months - those who recover (the majority), those who showed consistent and continuing fatigue (13% of cases), and a relapse group (7%). The latter showed signs of recovery at one month post-illness, suggesting recovery, but by six months the fatigue has worsened [2]. "Moreover, at 6 months, both the consistent and relapsing PIFS groups experienced significantly more severe symptoms, not only in terms of fatigue, but also in regard to pain, neurocognitive and mood disturbance and for symptom severity overall" (Fatt et al 2019 p6). It is proposed that "existing vulnerabilities" (eg: genetic make-up; stressors) determined the path of PIFS at one month as well as the severity of the original illness (Fatt et al 2019).

Son (2019) emphasised that "although patients present fatigue symptom as their main complaint in subjects suffering from chronic fatigue or CFS, CFS is considered as to being in totally different pathologic illness" (p89). It is the other symptoms, like unrefreshing sleep, that are part of CFS that make it different. In fact, Son (2019) suggested "the possibility that CFS is not a part of chronic fatigue-related diseases" (p89).

[2] Note that the relapse group "while not scoring above the threshold score for clinically significant fatigue at every assessment point, evidenced a score at 6 months indicative of post-infective fatigue syndrome" (Beilharz et al 2019 p1). Responding to comments to Fatt et al (2019), Beilharz et al (2019) observed: "Syndromal diagnoses inevitably have somewhat uncertain diagnostic boundaries. Therefore, there is good biological plausibility in the notion that some individuals will be sub-threshold for the diagnostic label at one timepoint and then develop more severe or additional symptoms and, hence meet the diagnostic criteria at another point in time" (p1).

The term "Systemic Exertion Intolerance Disease" (SEID) is an alternative to ME or CFS. The Institute of Medicine (IOM) (2015) in the USA proposed this term as a name change from ME or CFS or ME/CFS. The hope was that "the new name will send a signal to clinicians and patients, and could be the first step towards a widespread change of attitude, through improved acceptance and understanding of the patient experience. The name itself has been constructed by the IOM to reflect the literature. Systemic implies that the condition affects many body systems; exertion intolerance is meant to convey the central feature of the disorder, although most patients are fatigued even at rest; disease implies a pathological mechanism underlying the condition, but, as the authors suggest, no disease process has yet been properly identified" (The Lancet 2015 p663).

Another difference between chronic fatigue and CFS is that the recovery rate from chronic fatigue is about 50% compared to less than 10% for CFS (Son 2019).

Figure 2.1 conceptualises fatigue and CFS, and fatigue and CFS/SEID.
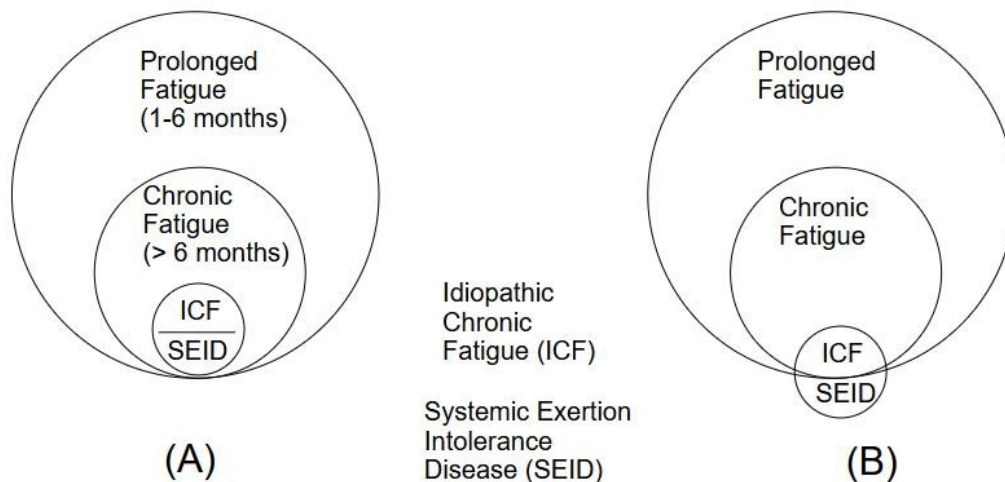
(After figure 1 Son 2019)

Figure 2.1 – Different conceptualisations of fatigue and CFS (A), and fatigue and SEID (B).

Raizen et al (2023) summarised the theoretical

models of fatigue, including:

i) The sensory attenuation hypothesis (De Doncker et al 2020) - "Fatigue is present when on perceives that a greater effort than expected is required to complete a task" (Raizen et al 2023 p4).

ii) Immune dysfunction - eg: increased cytokine production; impairment of energy production through mitochondrial dysfunction.

iii) Gut-brain interactions - eg: microbiota impact on brain circuits involved in reward and motivation.

iv) The metabolic trap hypothesis (Kashi et al 2019) - Enzyme dysfunction that compromises energy metabolism.

v) Brain energy metabolism - Mental fatigue as a result of insufficient lactate (the "unique energy source" of neurons in the brain; Raizen et al 2023 p5).

The "Effort Expenditure for Reward" task is used in experiments of human fatigue (eg: Lasselin et al 2017). Participants are offered a choice of a low effort/low monetary reward or a high effort/high reward task. Fatigue can be induced in healthy volunteers with an injection of the bacterial cell wall component lipopolysaccharide (LPS), which produces an immune response (Raizen et al 2023).

2.3. ME/CFS

ME/CFS is "a disabling long-term condition, characterised by severe fatigue, and other symptoms that are typically made worse by minimal physical or mental exertion (post-exertional fatigue and malaise). In addition to fatigue, other common symptoms include cognitive difficulties, sleep disturbance and muscle pain" (White et al 2023 p1).
Prognosis is "the proportion of subjects who improve or worsen according to a specific outcome, and within a discrete time period" (Ingman et al 2022 p2917). Cairns and Hotopf (2005), for example, reported that 39% of patients showed improvements in ME/CFS, 7% recovered, and 5-20% deteriorated over time. This was based on a review of naturalistic, cohort, and intervention studies (Ingman et al 2022). Definition of the "specific outcome" (and the time period) is crucial in evaluation of a treatment.

Das et al (2022) observed: "The breadth of symptoms and severities experienced by ME/CFS patients is likely indicative of the heterogeneous nature of the disorder, with a variety of metabolic, immunological, neuroendocrine and central nervous system dysfunctions underlying an individual patient's pattern of onset and development of the disease" (p1). These researchers continued: "The multi-factorial spectrum of ME/CFS triggers and symptoms invites the question whether ME/CFS may represent multiple patient sub-groups with a range of potentially overlapping underlying biological drivers" (Das et al 2022 p2).

Diagnosis of ME/CFS is based upon "the subjective report of six or more months of unexplained fatigue, including 'physical' fatigue, which is exacerbated by exercise or other physical activity; as well as a comparable phenomenon of neurocognitive difficulties, which are exacerbated by concentration-demanding mental activities" (Casson et al 2022 p1). In terms of "official" diagnostic criteria, the Centres for Disease Control (CDC) in the USA requires disabling fatigue, and four of the following eight symptoms - neurocognitive difficulties, sore throat, tender lymph nodes, muscle pain, joint pain, headaches, unrefreshing sleep, and post-exertional malaise (Casson et al 2022). Other criteria include the "Canadian Consensus", the "International Consensus", the "Oxford" [3], "National Institute for Health and Care Excellence" (NICE) [4] and "Institute of Medicine" criteria (Guo et al 2023).

Leaving aside covid-19-related fatigue, it is estimated that 1% of people suffer from ME/CFS (Smith 2022), while the figure of seventeen million sufferers worldwide has been quoted (Cox 2022). There is a gender difference of between 3-6 females to one male sufferer of ME/CFS (Guo et al 2023).

Underlying fatigue generally is cellular energy levels. Four areas of the brain seem to be involved in the "fatigue network" - the insula and the anterior cingulate cortex (part of the interoceptive network that monitors the body's internal state), the prefrontal cortex (related to future planning), and the striatum (part of the brain's reward system). Simply, a cost-benefit analysis of energy availability and expenditure

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[3] Includes six months of severe fatigue affecting physical and mental functioning, that is present over half the time, and with symptoms like myalgia, mood, and sleep disturbance (Ingman et al 2022).

[4] Includes four months of persistent or relapsing fatigue, substantially reduced activity, post-exertional malaise, and other symptoms as mentioned in other criteria (Ingman et al 2022).

is made with the output of motivation (Smith 2022).

Energy stores can be replenished with rest/sleep and eating, but not so with ME/CFS. One suggestion is that the body is using a less efficient food source (fats or amino acids) rather than glucose, while another possibility is the cells unable to get sufficient glucose and oxygen from the blood to produce energy (ie: a fault in the messages sent around the body). A further theory based on observations of individuals with ME/CFS and covid-19 is higher than average levels of microscopic blood clots. Over-reaction of the immune system and inflammation is a further possibility (Smith 2022).

"One explanation could be that there is 'an event happening early on in the disease process that eventually dissipates, but changed the gut environment'... Many people with ME/CFS report that their symptoms began after a viral infection, for instance. 'You can think of it sort of like a hit and run'" (Timothy Sampson in Wade 2023). There is both evidence of prior viral infection (eg: Epstein-Barr Virus) and not, but also for stress non-viral infection (Das et al 2022). Bacterial infection triggers include Lyme disease or Q fever (Lee et al 2021).

Studies on the genetic basis of ME/CFS have found "a demonstrable heritable component to the disease", but "no significant single-gene association" (Das et al 2022 p2). Combinatorial analysis, which identifies multiple genes in common among sufferers of a disease, may be a better method to use, and Das et al (2022) did so with UK Biobank data on ME/CFS sufferers (n = 2382 patients, and 4764 matched controls) [5]. The researchers identified sites on fourteen genes that were common to 90% of the sample. "Many of the genes identified are linked to the key cellular mechanisms hypothesised to underpin ME/CFS, including vulnerabilities to stress and/or infection, mitochondrial dysfunction, sleep disturbance and autoimmune development" (Das et al 2022 p1). Also there were "similarities with genes associated with multiple sclerosis and long covid, which share some symptoms and potentially a viral infection trigger with ME/CFS" (Das et al 2022 p1).

The sample, however, admitted the researchers, was "a small cohort of atypically older ME/CFS patients with predominantly white, European ancestry who have self-reported their clinical diagnosis. The lack of detailed ME/CFS-specific supporting clinical and/or phenotypic

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[5] Using combinatorial analysis, Taylor et al (2020) reported sixty-eight genes associated with the risk of developing severe covid-19.

data makes it hard to evaluate individual clinical experiences and assess potential triggers of disease onset, recovery or relapse" (Das et al 2022 p15) [6]. For example, an average age of 56 years, when the average age of onset of ME/CFS is in the 30s (Das et al 2022). "On the other hand, an older population may be more accurately diagnosed" (Das et al 2022 p15).

Brain activity is an area of interest. "One potential focus for the neurocircuitry of fatigue in CFS is the basal ganglia. The basal ganglia play a fundamental role in the regulation of motor activity and motivation and have been implicated as a major brain system associated with fatigue. For example, fatigue is common in patients with neurologic disorders that involve the basal ganglia including Parkinson's disease and multiple sclerosis as well as in human immunodeficiency virus (HIV), where infected patients exhibit early cognitive/motor disturbances. In addition, lesions of the basal ganglia have been associated with marked fatigue as well as psychomotor slowing. In CFS patients, neurocognitive testing has also revealed specific impairments compatible with basal ganglia dysfunction, including motor slowing that correlated with severity of fatigue" (Miller et al 2014 p1).

Miller et al (2014) provided support with functional magnetic resonance imaging scans of eighteen patients with ME/CFS and forty-one non-fatigued healthy controls. The ME/CFS participants were a sub-group of a sample recruited via random-digit-dialling in Georgia, USA, in 2004-5, who reported ME/CFS-like symptoms (Reeves et al 2007).

During the scanning, participants performed a gambling task known to produce activation of the basal ganglia. Miller et al (2014) explained: "In the task, participants had to guess which of two cards presented face-down on a screen was 'red' (hearts or diamonds) by pressing one of two buttons on a MRI [magnetic resonance imaging] response box held in their right hand. Two seconds into the trial, the selected card was turned over, and, depending on its colour, the participant either won (red card) or lost (black card) one dollar. Unbeknownst to the subject, the sequence of wins and losses was temporally arranged as a noisy sinusoid with a slow linear trend that favoured wins over time. This procedure allowed for experimental control of the task while masking the deterministic nature of the game from the participant, thereby eliciting a realistic feeling of

gambling while playing. At the beginning of the game, each participant started with a credit of $16 and ended with a total win sum of $23, which the volunteer believed was contingent on his/her specific gambling choice but was in fact fixed for all subjects" (p2).

Reduced activity in the basal ganglia was observed among the ME/CFS group, and this correlated with symptoms of fatigue.

Differences in the gut microbiome have been found between ME/CFS patients and healthy controls. For example, Guo et al (2023) compared 106 ME/CFS cases and 91 healthy volunteers matched for age, sex, body mass index, and demographics in the USA. "Faecalibacterium prausnitzii [7] and Eubacterium rectale, which are both recognised as abundant, health-promoting butyrate producers in the human gut, were reduced in ME/CFS" (Guo et al 2023 p288). This was based on stool sample analysis. It was also found that Faecalibacterium prausnitzii abundance was negative associated with the severity of fatigue. Severity of fatigue was measured by the twenty-item "Multi-Dimensional Fatigue Inventory" (MFI) (Smets et al 1995), which covers five dimensions (general, physical, and mental fatigue, reduced activity, and motivation) to give a total score out of 100.

The "myalgic encephalomyelitis", VanElzakker et al (2019) observed "essentially means 'muscle pain (myalgia) related to central nervous system inflammation (encephalomyelitis)'" (p2). The problem according to these researchers was measuring neuroinflammation, and understanding its relations to the symptoms of ME/CFS. Neuroimaging is a common method, and VanElzakker et al (2019) argued that optimal techniques for studying the brainstem, in particular, had not been used.

Keller et al (2014) commented: "Identifying an objective indicator of ME/CFS would be useful, particularly to accelerate a normally protracted path to diagnosis. Because post-exertional fatigue associated with ME/CFS contributes to physical activity intolerance, a measurement of maximal oxygen consumption (VO_2peak) would be expected to indicate low aerobic capacity compared to normal values for age, sex, and activity level" (p2). Where VO_2peak has been studied in ME/CFS adult patients, it is between 30-90% that of healthy controls and/or of predicted values for age and sex

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[7] Faecalibacterium prausnitzii produces anti-inflammatory molecules called short-chain fatty acids and too little of these linked to increased inflammation (Wade 2023)

(Keller et al 2014).

Keller et al (2014) investigated this issue further with twenty-two patients in the USA. The participants completed two cycling-based cardio-pulmonary exercise tests (CPETs) to measure VO_2peak, separated by 24 hours. The average VO_2peak was 77% of predicted sex and age. The scores on the second CPET were lower (by an average of 15%). This was evidence of a physiological impairment, though the researchers could not explain it [8]. But the study did show that two CPETs separated by a day, say, is better than one CPET. The researchers stated: "Data from a single CPET resulted in classification of 12 of 22 patients as having little or no impairment, and eight as having mild/moderate impairment. Such individuals would likely be prescribed graded exercise therapy (GET) to improve aerobic capacity. However, data from the second CPET in this and prior studies indicate that aerobic energy-producing processes fail to respond normally to exercise stress in ME/CFS patients. Thus, incautiously applied GET is likely to result in exacerbation of fatigue and other symptoms of ME/CFS patients" (Keller et al 2014 p8).

Keller et al (2014) also pointed out: "We know that our data does not result from any methodological or equipment problems, because during the same time period the ME/CFS patients were being tested, we performed several repeat CPETs on healthy individuals, who demonstrated comparable or better consistency and reproducibility for VO_2peak compared to published values" (p8).

Finally, the researchers observed: "ME/CFS patients currently represent a unique class of ill patients who do not reproduce maximal CPET measures, unlike individuals with cardiovascular disease, lung disease, end-stage renal disease, pulmonary arterial hypertension, and cystic fibrosis" (Keller et al 2014 p8).

2.3.1. Treatment

Cures are lacking, so management of symptoms is the recommended treatment (Casson et al 2022).

A comprehensive review of treatments by Chou et al (2022) found sixty-six studies on ME/CFS published between 1988 and January 2019. "Cognitive Behavioural Therapy (CBT) and exercise therapy were associated with improved fatigue, function, and other outcomes versus

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[8] Subsequently, the idea has been developed as "bioenergetic muscle dysfunction" (ie: diminished oxygen supply to muscles) (Wirth and Scheibenbogen 2020).

inactive control therapies, but the magnitude of effects based on average benefits was small to moderate" (Chou et al 2022 pii). The problem, as found in subsequent reviews, was the variety in methodological issues between the studies (eg: definition of ME/CFS that does not include PEM). Particularly, Chou et al (2022) noted the limited number of severe ME/CFS patients involved.

These researchers commented that "pharmacological, [other] non-pharmacological, dietary, and complementary and alternative therapies were ineffective, or evidence of effectiveness was too limited to reliably evaluate benefits and harms" (Chou et al 2022 piii).

Concentrating on the two forms of therapy that have been found to be beneficial for many sufferers:

a) Graded exercise therapy (GET) - This involves "the establishment of a dose or 'threshold' of exercise or physical activity that can be completed without causing a prolonged worsening of symptoms, after which incremental increases in the duration and/or intensity of the activity are made" (Casson et al 2022 p13).

b) Cognitive-behavioural therapy (CBT) - This focuses on dysfunctional beliefs. For example, users are encouraged to "address beliefs such as fear regarding the relative benefits of activity, high self-expectations, and all-or-nothing thinking" (Chalder et al 2010 quoted in Casson et al 2022).

GET and CBT can be used together, and can include "activity pacing". This can be defined as "an approach where patients are encouraged to be as active as possible within the limits imposed by the illness... pacing requires the individual to determine a level at which they can function but which does not lead to a marked increase in fatigue and other symptoms for up to five days. Minor and transient symptoms which do not make the person feel unwell may be ignored" (Goudsmit et al 2012 quoted in Casson et al 2022).
Casson et al (2022) explained that the "rationale for activity pacing is to address maladaptive behaviours, which include periods of over-activity triggering worsened symptoms as part of the recognised post-activity exacerbation phenomenon, followed by prolonged periods of rest to recover. This pattern is commonly referred to as a 'boom-bust' activity cycle [van der Werf et al 2000]; whereas 'activity avoidance' refers to a dominant pattern of inactivity in anticipation of worsened fatigue

symptoms" (p2). Ultimately, the idea is to find a baseline of activity that the individual can achieve, and then to slowly increase it (ie: "graded activity"). This includes both physical and cognitive activities, whereas GET tends to focus on physical activities only (Casson et al 2022).

Ingram et al (2022) outlined the problems for reviews of studies on ME/CFS, "as these are limited by the synthesis of data obtained from multiple measurement tools, the inclusion of non-randomised studies, which may produce between-group imbalances or biased findings, or studies with a short-term follow-up. The use of non-specialist diagnostic procedures, or broad inclusion criteria (eg: idiopathic chronic fatigue), may also lead to misclassification and yield findings that do not apply to CFS" (p2918).

Two key reviews or meta-analyses of these two therapies have been published recently - Casson et al (2022), and Ingman et al (2022).

Casson et al (2022) reviewed the evidence on activity pacing interventions, including only randomised controlled trials (lasting four weeks or more) with patients with a primary diagnosis of ME/CFS. Fourteen studies (published before August 2022 in English) were classified as eligible. The researchers concluded: "Activity pacing interventions are effective in reducing fatigue, psychological distress and depression [9], and improving physical function in CFS, especially when patients are advised to gradually increase their activities" (Casson et al 2022 p13).

The methodology of the studies varied in a number of ways. For example, in the duration, frequency, mode of delivery, and the type of health professional delivering the activity pacing intervention. Interventions varied between three and eighteen months, and follow-up between zero to fifteen months. CBT was included in almost all interventions.

Nearly 80% of participants overall were female. Also Casson et al (2022) noted that "a major limitation of the studies was the lack of data on how well patients adhered to activity pacing (or the intervention more broadly)..." (p13).

The key strengths of the studies included in the review were:

a) Randomised controlled trials - ie: participants

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[9] Depression was the most common non-ME/CFS symptom reported in a review (by 18.5% of ME/CFS patients), followed by serious health problems (4.3%) (Chou et al 2022).

randomised to treatment or control.

b) Validated outcome measure - "Medical Outcomes Survey Short Form-36" questionnaire.

Ingman et al (2022) included only randomised controlled trials investigating CBT and GET in their review - fifteen trials (10 with CBT and five with GET).

Overall, "the proportion of improved participants was higher following CBT, compared to control..." (Ingman et al 2022 p2921). The exact difference varied with the outcome used. For example, with fatigue, 23% more participants improved in the CBT group on average (ie: mean 43% improved in CBT group vs 20% in the control group), while the difference was 20% for subjective rating of improvement.

Similarly, more participants improved with GET compared to controls - 23% more with the outcome of physical functioning, for example (ie: mean 61% vs 38% improved).

Ingram et al (2022) accepted that one-third of the included studies were rated as weak for methodological quality (eg: not controlling for relevant individual differences between the treatment and control groups). No study involving blinding of participants, "which increases the risk of performance or detection bias. However, blinding is not possible in trials of psychotherapeutic treatments while it has been suggested that concerns over bias caused by lack of blinding may be exaggerated" (Ingman et al 2022 p2925). The use of subjective, self-ratings as the main outcome measure was common.

There was heterogeneity in the methodology of the studies, as found by Casson et al (2022) (table 2.3).

- Diagnostic criteria for ME/CFS

- Treatment doses (eg: 14 sessions of CBT; 12 sessions of GET) and administration (eg: self-help manual; face-to-face contact; telephone support)

- Outcome measures

- Length of study (eg: 12 weeks; 26 weeks)

- Control group (eg: standard medical care; generic advice)

Table 2.3 - Key methodological differences in the studies in the review of Ingman et al (2022).

The reviews by Casson et al (2022) and Ingman et al

(2022) covered different but overlapping areas, and included five studies in common. Table 2.4 outlines the main differences in their methodology.

	Casson et al (2022)	Ingman et al (2022)
Databases search	MEDLINE, PubMed, EBSCOHost, Web of Science, PEDro, EMBASE, PsycINFO, Cochrane Library	MEDLINE, EMBASE, PsycINFO, Web of Science
Search dates	up to 13th August 2022	1988 - March 2021
Search terms used	"The search strategy, which included terms relating to CFS and activity pacing interventions, were adapted for each database" (Casson et al 2022 p2)	chronic fatigue syndrome, cognitive behavioural therapy, graded exercise therapy, randomised controlled trials, prognosis. Slight variations for each database
Study selection criteria	randomised controlled trials (at least 4 weeks long); primary diagnosis of ME/CFS; activity pacing intervention; English language; validated outcome measure	original data from English-language peer-review journal; randomised controlled trial; clear criteria for ME/CFS diagnosis; individual- or group-based CBT or GET; treatment outcome
Study quality rated	Physiotherapy Evidence Database (PEDro) Scale	Effective Public Health Practice Project (EPHPP) criteria

Table 2.4 - Key differences in methodology between two reviews Casson et al 2022 and Ingman et al 2022).

Aripiprazole is an anti-depressant drug that works upon dopamine in the brain, but it may lead to improvements in fatigue and cognitive symptoms in ME/CFS. Crosby et al (2021) reviewed the medical records of 101 patients with ME/CFS seen at the Stanford University School of Medicine, who received aripiprazole off-label (ie: for a condition that it is not officially approved). Three-quarters of the sample reported an improvement in at least one of the following symptoms - fatigue, "brain fog", unrefreshing sleep, frequency of PEM episodes, or "crashes" (ie: the need to spend long periods in bed). Of the other quarter, half showed no difference and half had worsening symptoms.

This was not a controlled trial, but a retrospective analysis of medical records. So, there was great variety in the dose of the drug, and the duration of the

treatment, for example.

The researchers ended: "Exploring the mechanism of action for aripiprazole in neuroinflammatory conditions may also provide new insight into the pathogenesis of ME/CFS" (Crosby et al 2021 p3).

2.4. REFERENCES

Beilharz, J.E et al (2019) Response to commentary: Myalgic encephalomyelitis, chronic fatigue syndrome, and chronic fatigue: Three distinct entities requiring complete different approaches Current Rheumatology Reports 21, 6, article 22

Berger, A et al (2020) NCCM Guidelines Version 1.2020-cancer-related fatigue Journal of the National Comprehensive Cancer Network 8, 8, 904-931

Bonilla, H et al (2023) Myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) is common in post-acute sequelae of SARS-CoV-2 infection (PASC): Results from a post-covid-19 multi-disciplinary clinic Frontiers in Neurology 14, 1090747

Cairns, R & Hotopf, M (2005) A systematic review describing the prognosis of chronic fatigue syndrome Occupational Medicine 55, 1, 20-31

Casson, S et al (2022) The effectiveness of activity pacing interventions for people with chronic fatigue syndrome: A systematic review and meta-analysis Disability and Rehabilitation (https://www.tandfonline.com/doi/full/10.1080/09638288.2022.2135776)

Chalder, T et al (2010) Family-focused cognitive behaviour therapy versus psycho-education for chronic fatigue syndrome in 11- to 18-year-olds: A randomised controlled treatment trial Psychological Medicine 40, 8, 1269-1279

Chou, R et al (2022) Management of Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS): An Updated Systematic Evidence Review Portland, OR: Pacific Northwest Evidence-based Practice Centre

Cox, D (2022) Genes may raise chronic fatigue risk New Scientist 1st October, p12

Crosby, L.D et al (2021) Off label use of aripiprazole shows promise as a treatment for myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS): A retrospective study of 101 patients treated with a low dose of aripiprazole Journal of Translational Medicine 19, article 50

Das, S et al (2022) Genetic risk factors for ME/CFS identified using combinatorial analysis Journal of Translational Medicine 20, article 598

Davis, H.E et al (2022) Characterising long covid in an international cohort: Seven months of symptoms and their impact

EClinicalMedicine 38, 101019

De Doncker, W et al (2020) Exploring the relationship between effort perception and post-stroke fatigue Neurology 95, e3321-3330

Fatt, S.J et al (2019) The invisible burden of chronic fatigue in the community: A narrative review Current Rheumatology Reports 21, article 5

Gonzalez-Hermosillo, J.A et al (2021) Post-acute covid-19 symptoms, a potential link with myalgic encephalomyelitis/chronic fatigue syndrome: A 6-month survey in a Mexican cohort Brain Sciences 11, 6, article 760

Goudsmit, E.M et al (2012) Pacing as a strategy to improve energy management in myalgic encephalomyelitis/chronic fatigue syndrome: A consensus document Disability and Rehabilitation 34, 13, 1140-1147

Guo, C et al (2023) Deficient butyrate-producing capacity in the gut microbiome is associated with bacterial network disturbances and fatigue symptoms in ME/CFS Cell Host and Microbe 31, 288-304

Ingman, T et al (2022) A systematic literature review of randomised controlled trials evaluating prognosis following treatment for adults with chronic fatigue syndrome Psychological Medicine 52, 2917-2929

Institute of Medicine (2015) Beyond Myalgic Encephalomyelitis/Chronic Fatigue Syndrome: Redefining an Illness Washington DC: National Academies Press

Jason, L.A & Dorri, J.A (2023) ME/CFS and post-exertional malaise among patients with long covid Neurology International 15, 1-11

Jason, L.A & Islam, M.F (2022) A classification system for post-acute sequelae of SARS-CoV-2 infection Central Asian Journal of Medical Hypotheses and Ethics 3, 1, 38-51

Kashi, A.A et al (2019) The IDO metabolic trap hypothesis for the aetiology of ME/CFS Diagnostics 9, 3, article 82

Kasimir, F et al (2022) Tissue specific signature of HHV-6 infection in ME/CFS Frontiers in Molecular Biosciences 9, 1369

Kedor, C et al (2022) Chronic covid-19 syndrome and chronic fatigue syndrome (ME/CFS) following the first pandemic wave in Germany - A first analysis of a prospective observational study Nature Communications 13, 5104

Keller, B.A et al (2014) Inability of myalgic encephalomyelitis/chronic fatigue syndrome patients to reproduce VO$_2$peak indicates functional impairment Journal of Translational Medicine 12, article 104

Lam, M.H-B et al (2009) Mental morbidities and chronic fatigue in severe acute respiratory syndrome survivors: Long-term follow-up Archives of Internal Medicine 169, 22, 2142-2147

Lasselin, J et al (2017) Lipopolysaccharide alters motivated behaviour in a monetary reward task: A randomised trial Neuropsychopharmacology 42, 4, 801-810

Lee, J-S et al (2021) Salivary DNA loads for human herpesviruses 6 and 7 are correlated with disease phenotype in myalgic encephalomyelitis/chronic fatigue syndrome Frontiers in Medicine 8, 656692

Magnus, P et al (2015) Chronic fatigue syndrome/myalgic encephalomyelitis (CFS/ME) is associated with pandemic influenza infection, but not with an adjuvanted pandemic influenza vaccine Vaccine 33, 46, 6173-6177

Mancini, D.M et al (2021) Use of cardio-pulmonary stress testing for patients with unexplained dyspnea post-coronavirus disease JACC: Heart Failure 9, 927-937

Marshall, M (2023) Rethinking chronic conditions New Scientist 4th March, 14-15

Miller, A.H et al (2014) Decreased basal ganglia activation in subjects with chronic fatigue syndrome: Association with symptoms of fatigue PLoS ONE 9, 5, e98156 (Freely available at https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0098156)

Nehme, M et al (2022) The prevalence, severity, and impact of post-covid persistent fatigue, post-exertional malaise, and chronic fatigue syndrome Journal of General Internal Medicine 38, 3, 835-839

Oke, T (2023) A patient who recovered from post-covid myalgic encephalomyelitis/chronic fatigue syndrome: A case report BioPsychoSocialMedicine 17, article 8

Raizen, D.M et al (2023) Beyond the symptom: The biology of fatigue Sleep 46, 9, zsad069

Ramirez-Morales, R et al (2022) Clinical overlap between fibromyalgia and myalgic encephalomyelitis. A systematic review and meta-analysis Autoimmunity Reviews 21, 8, 103129

Reeves, W.C et al (2007) Prevalence of chronic fatigue syndrome in metropolitan, urban, and rural Georgia Population Health Metrics 5, article 5

Salari, N et al (2022) Global prevalence of chronic fatigue syndrome among long covid-19 patients: A systematic review and meta-analysis BioPsychoSocialMedicine 16, article 21

Simani, L et al (2021) Prevalence and correlates of chronic fatigue syndrome and post-traumatic stress disorder after the outbreak of the covid-19 Journal of NeuroVirology 27, 154-159

Smets, E.M et al (1995) The Multi-Dimensional Fatigue Inventory (MFI) psychometric qualities of an instrument to assess fatigue Journal of Psychosomatic Research 39, 315-325

Smith, D.G (2022) Figuring out figure New Scientist 10th September, 43-46

Son, C-G (2019) Differential diagnosis between "chronic fatigue" and "chronic fatigue syndrome" Integrative Medicine Research 8, 89-91

Taylor, K et al (2020) Analysis of genetic host response risk factors in severe covid-19 patients medRxiv (https://www.medrxiv.org/content/10.1101/2020.06.17.20134015v2)

The Lancet (2015) Editorial: What's in a name? Systemic exertion intolerance disease Lancet 385, p663

The leader (2023) Into the spotlight New Scientist 4th March, p5

Twomey, R et al (2021) Chronic fatigue and post-exertional malaise in people living with long covid: An observational study Physical Therapy and Rehabilitation Journal 102, 4, pzac005

van der Werf, S.P et al (2000) Identifying physical activity patterns in chronic fatigue syndrome using actigraphic assessment Journal of Psychosomatic Research 49, 5, 373-379

VanElzakker, M.B et al (2019) Neuroinflammation and cytokines in myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS): A critical review of research methods Frontiers in Neurology 9, article 1033

Wade, G (2023) Chronic fatigue linked to gut bacteria New Scientist 8th February, p20

White, P et al (2023) Anomalies in the review process and interpretation of the evidence in the NICE guideline for chronic fatigue syndrome and myalgic encephalomyelitis Journal of Neurology, Neurosurgery and Psychiatry (https://jnnp.bmj.com/content/early/2023/07/09/jnnp-2022-330463)

Wirth, K & Scheibenbogen, C (2020) A unifying hypothesis of the pathophysiology of myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS): Recognitions from the finding of autoantibodies against beta2-adrenergic receptors Autoimmunity Reviews 19, 6, 102527

3. DIFFERENT RESEARCH METHODS

3.1. ONLINE SURVEYS

Online surveys have advantages including "completely self-administered which... reduces the chance for social desirability bias" (p2) (compared to face-to-face interviews), and they are relatively cheap, and easy to create and use (Braekman et al 2023). But such surveys "exclude people without internet access or skills to use the internet by default to complete the survey" (eg: 6% of Belgian adults never use the internet) (Braekman et al 2023 p2). Mostly online surveys use opportunity, convenience, or volunteer sampling.

These issues were forced into the background during covid-19 when online surveys were the only (or at least, major) method of collecting health data. Braekman et al (2023) described the experiences of designing and running ten repeated online surveys between April 2020 and March 2022 in Belgium. Five main areas of health and behaviour were surveyed including the impact of covid-19 on mental health, and different areas of life, preventive measures taken to reduce transmission, and health consequences of the virus.

The participation rate declined with time (eg: nearly 50 000 responses for Survey 1 compared to around 14 000 in the last survey). However, 12 500 participants completed at least five of the surveys. "The benefit of following up the same individuals over time is that the evolution found for certain outcomes such as mental health throughout the pandemic cannot be due to different sample compositions across different time points" (Braekman et al 2023 p11).

The sample (compared to the general population) was more females, less 18-24 year-old and 65 years plus adults, and higher education level. "As a consequence,

caution is needed when generalising results deriving from these type of non-probability web surveys to the general population. It is not recommended to calculate descriptive estimates such as prevalence rates from these surveys. However, in the beginning of the pandemic there was an urgent need to have figures about the impact on the Belgian population. As there was no alternative in the form of a probability survey including people without internet access, the prevalence rates of the covid-19 health surveys were considered as informative" (Braekman et al 2023 p10).

"River sampling" was used, which "refers to recruiting participants by putting an invitation to complete a survey on a website, a social media page, etc. where it is likely to be noticed by members of the target population. Lehdonvirta et al [2021] describe it poetically as 'researchers dipping into the traffic flow of a website, catching some of the users floating by'. All covid-19 health surveys were announced on the website, the Twitter and LinkedIn of Sciensano [Belgian Institute of Health]. In addition, they were announced via (online) articles of national press organisations because each survey had a press release" (Braekman et al 2023 p6).

Snowball sampling was also used, which asked already-involved participants to recruit friends, family, and others for the next survey.

3.2. POSTAL SURVEYS

Choice of drinking water (from the tap or a bottle) at home is influenced by two factors - water characteristics (eg: sensory evaluation; health concerns; hardness of water), and mediators (eg: convenience; price; trust in providers; lifestyle) (Suzuki 2023).

Health concerns are key. Suzuki (2023) investigated three such concerns (or health anxieties) - health maintenance, pesticide residues in food, and covid-19 infection - Tokyo, Japan. Over 1200 adults (20-69 years old) were surveyed in October-November 2021.

"Health maintenance" is "a general and vague anxiety about one's health" (Suzuki 2023 p765), and it indicates the general perception of risk about health in everyday life. Concern about pesticide residues in food was used as an indicator of worry about diet and health risk. Anxiety about covid-19 infection was used to indicate concern about infectious diseases in general. Each question was scored on a four-point scale: "I don't feel

anxious at all" (1) to "I feel anxious" (4).

The outcome measure was the type of drinking water at home (untreated tap, purified tap, and bottled). This was also scored on a four-point scale - "never drink" (1) to "drink" (4). Six demographic variables were controlled for in the statistical analysis (eg: gender; age; with or without children).

The findings were as follows:

a) A significant positive correlation between concern about health maintenance and drinking untreated tap water. "Two interpretations of these causal relations are conceivable: one is that the stronger the health maintenance anxiety, the more people choose untreated tap water, trusting the safety standards of tap water in Japan (Tokyo). The other is that the behaviour of repeatedly drinking untreated tap water on a daily basis itself is a contributing factor to the rise of anxiety about maintaining their health" (Suzuki 2023 p769).

b) A significant positive correlation between concern about pesticide residues in food and choice of purified tap water, and a non-significant negative relationship to untreated tap water.

c) Concern about covid-19 infection had no relationship to drinking water choice.

This was an exploratory study conducted in one metropolitan area via postal questionnaire during the pandemic. The response rate was 38%. Single questions were used for each variable, and a four-point response scale.

3.3. PRISON STUDY

Vaccination together with previous covid-19 infection reduces the risk by 40% of passing on covid-19 if re-infected compared to unvaccinated individuals with no previous infection (Wilson 2022). This was established in 35 California state prisons during the Omicron wave (December 2021 - May 2022) (Tan et al 2023) (table 3.1).
Unvaccinated Omicron cases had a 36% risk of transmitting infection to close contacts compared to 28% for a vaccinated individual. During the study period, there were over 22 000 confirmed cases and thirty-one hospitalisations (out of nearly 112 000 prisons; 97% male). Analysis was based on 1226 index cases (273

unvaccinated matched with 953 vaccinated based on
institution and time period of infection), and close
contacts were defined as "residents who shared a cell
with an index case for at least one night while the index
case was infectious (assuming a five-day infectiousness
period after a positive test)" (Tan et al 2023 p359).

Overall, vaccination reduced the risk of
transmission of infection by 22%, and each dose by a
further 11%, while prior infection reduced the risk by
23%. Prior infection and vaccination lowered the risk of
transmission of infection by 40%.

STRENGTHS	WEAKNESSES
1. Detailed records of all inmates, including covid-19 infection and vaccination histories, and close contacts. 2. Regular testing for covid-19. 3. Large sample.	1. Potential confounders - eg: difference in behaviour between vaccinated and unvaccinated individuals. 2. Regularity of testing varied between institutions. 3. "There is a possibility that close contacts who test positive for SARS-CoV-2 were not infected by their assigned index case but, instead, by interaction with infectious individuals outside of their cell" (Tan et al 2023 p363).

Table 3.1 - Key strengths and weaknesses of using a
prison population in this study.

3.4. MISCELLANEOUS

3.4.1. Cell-Based Study

A bronchial cell-based study (Bojkova et al 2022)
infected with Delta or Omicron BA.1 and BA.5 variants,
then the H1N1 influenza virus. H1N1 virus increased in
control and Delta-infected cells, but not in Omicron-
infected cells (Wong 2022). Omicron induces a stronger
specific immune response (interferon), and it is this
that protects against influenza (Bojkova et al 2022).
It had been observed in the community that influenza
A virus transmission levels declined during the emergence
of Omicron BA.1 (Eldesouki et al 2022).

3.4.2. Case Studies

A case was reported in the UK in April 2023 of a

healthy 32 year-old man who died of a rare reaction to the AstraZeneca covid vaccine. The individual died in January 2021 of a "vaccine-induced thrombosis", but it took a coroner's court to change the death certificate cause of death (Sawer 2023).

There were around eighty people in the UK who had died similarly from this vaccine (out of more than 144 million doses of covid vaccines in England, for example) (Sawer 2023).

3.4.3. Animal Models

Work with mice (Robinson et al 2022) has shown that the longer the immune response to a vaccine lasted, the more of certain cells that help in this process. "'This would suggest that the longer you can prolong this immune response, the more anti-body-secreting cells you will will accumulate, and the best ones will be at then end' [David Tarlington of Robinson et al 2022]... This means that vaccines might be more effective if they are designed to trigger months-long, rather than weeks-long, immune responses... That could involve adjusting the way the vaccine delivers antigens into the body, for example, or adding other substances called adjuvants that modulate the immune response" (Leste-Lasserre 2022 p15).

3.4.4. Official Figures

Official figures in the UK suggested that there were over 3800 excess deaths from cirrhosis and other liver diseases between March 2020 and June 2022 as compared to the five-year averages (a 20% increase), (and nearly 3500 excess deaths from diabetes in the same period) (Murugesu 2022). Reasons include problems with accessing healthcare during the pandemic and lockdowns, and increased alcohol consumption at this time. US data for 2019-20 showed a similar increase in deaths from alcohol-related liver disease (Murugesu 2022).

3.4.5. Genetics

"The genome sequences of millions of individual SARS-CoV-2 viruses have enabled researchers to study evolution in a way that wasn't possible before" (Le Page 2023 p11). The virus has proliferated so much during the pandemic that every possible single-letter RNA mutation

has happened on average 15 000 times (Bloom and Neher 2023).

3.4.6. Limits of Knowledge

Talking primarily about the physical (or natural) sciences, The leader (2023) stated: "It is helpful, for instance, to distinguish between things we can never know, owing to the fundamental constraints of the physical world, and things we don't know but could find out in future" (p5). This distinction could be applied to any discipline.

Lewton et al (2023) outlined five key obstacles to the pursuit of knowledge (again with particular reference to the physical sciences):

i) Measurement is not possible.

ii) Phenomena are "outrageously complicated" (Lewton et al 2023 p40).

iii) The tools to describe the world may be unreliable.

iv) "When we can't directly experience something" (Lewton et al 2023 p42) eg: We have "no way to know if one person's 'ache' is another's 'agony'. It is impossible for me to feel your pain" (Stephen Law in Lewton et al 2023).

v) "When logic itself might be fatally flawed" (Lewton et al 2023 p44) - eg: paradoxes.

3.5. REFERENCES

Bloom, J.D & Neher, R.A (2023) Fitness effects of mutations to SARS-CoV-2 proteins bioRxiv (https://www.biorxiv.org/content/10.1101/2023.01.30.526314v2)

Bojkova, D et al (2022) Omicron-induced interferon signalling prevents influenza A virus infection bioRxiv (https://www.biorxiv.org/content/10.1101/2022.09.06.506799v1)

Braekman, E et al (2023) Data collection in pandemic times: The case of the Belgian covid-19 health surveys Archives of Public Health 81, 124

Eldesouki, R.E et al (2022) The circulation of non-SARS-CoV-2 respiratory viruses and co-infections with SARS-CoV-2 during the surge of the Omicron variant Journal of Clinical Virology 153,

105215

Lehdonvirta, V et al (2021) Social media, web, and panel surveys: Using non-probability samples in social and policy research Policy and Internet 13, 1, 134-155

Le Page, M (2023) Coronavirus mutations offer a new insight into evolution New Scientist 11th February, p11

Leste-Lasserre, C (2022) Hints at how to improve vaccine protection New Scientist 5th November, p15

Lewton, T et al (2023) The limits of knowledge New Scientist 14th January, 38-45

Murugesu, J.A (2022) Lockdown impact on liver disease New Scientist 12th November, p8

Robinson, M.J et al (2022) Long-lived plasma cells accumulate in bone marrow at a constant rate from early in an immune response Science Immunology 7, eabm8389

Sawer, P (2023) "Fit" doctor died from unintended consequences of the covid vaccine The Daily Telegraph 20th April, p7

Suzuki, K (2023) Do health concerns stemming from personality trait influence the choice of drinking water at home? An analysis of the survey results conducted in the Tokyo area under the covid-19 pandemic Journal of Water and Health 21, 6, 763-770

Tan, S.T et al (2023) Infectiousness of SARS-CoV-2 breakthrough infections and reinfections during the Omicron wave Nature Medicine 29, 358-365

The leader (2023) Know your limits New Scientist 14th January, p5

Wilson, C (2022) Vaccines cut covid spread New Scientist 10th September, p7

Wong, C (2022) Omicron variant may protect against flu New Scientist 24th September, p11

4. MISCELLANEOUS

4.1. VARIANTS

(1) Omicron XBB.1.16 variant of SARS-CoV-2 was reported in late February 2023 in India (Yamasoba et al 2023). It had a higher reproductive number (R_e) than XBB.1 and XBB.1.5 (ie: more infectious), while in vitro experiments suggested that all three variants "are robustly resistant to several anti-SARS-CoV-2 anti-bodies" (Yamasoba et al 2023 p655).

(2) "Until recently, the covid-19 pandemic jumped from one variant to the next, such as from delta to omicron... 'Typically, a new variant came and displaced all or most other preceding lineages very quickly, but now we're seeing a real mix of sub-variants, with much more incremental changes that result from them acquiring a portfolio of mutations all over the viral genome' [Moritz Gerstung]... High levels of immunity due to vaccination or from previous infection are creating a selection pressure towards immune-evading variants" (Wong 2022b p11).
For example, there was concern in late 2022 around sub-variant BQ.1.1, a descendent of omicron BA.5 sub-variant BQ.1, first identified in Nigeria in July 2022 (Wong 2022b).

4.2. KNOCK-ON EFFECTS

(1) Fewer male babies were born in England and Wales in mid 2020 than expected. Between 2012 and 2020, 1054 boys were born to every 1000 girls, and this declined to 1040 boys in June 2020 (Masukume et al 2023). The birth sex ratio returned to pre-pandemic levels by August 2020 (Klein 2022).
It has been observed previously that 3-5 months after a major stressful event less males are born (eg: New York City after 9/11). "Stressful events may activate non-conscious evolved mechanisms in pregnant people to spontaneously abort foetuses that have less chance of

thriving in tough environments... Male foetuses are more likely to be frail than female ones, meaning 'their mothers may be unconsciously gauging that it's not the best environment to bring them into' [Tim Bruckner]" (Klein 2022 p12).

(2) Changes in the annual flu epidemic were observed in Australia in winter 2022 - a higher peak of cases than average, and an earlier surge (in May and June rather than July and August). The idea of "twindemic" (flu and covid epidemics at the same time) was also possible (Wilson 2022a).

(3) Covid-19 may be linked to anti-biotic resistance in a pneumonia bacterium, according to a modelling study. Concentrating on Streptococcus pneumoniae, Kovacevic et al (2023) simulated coronavirus cases and anti-biotic resistance of this bacterium over one year. Streptococcus pneumoniae lives in the throat of many people harmlessly usually, but with the immune system fighting off SARS-CoV-2, the bacterium becomes a health risk (for pneumonia and serious blood infection), and anti-biotics are prescribed (Wong 2023).

4.3. PANDEMIC

The World Health Organisation defined a pandemic as "the spread of an infectious disease over three continents" (Doshi 2011 quoted in Keck 2022) [10]. From an anthropology perspective, Briggs and Mantini-Briggs (2003) described a pandemic as a "chronotope, a narrative device for connecting social, biological and spatial elements and ordering them in temporal sequences and interpretive frameworks" (quoted in Keck 2022).

Keck (2022) observed: "Pandemics tend to be defined as large epidemics, ie: as sudden and widespread rises in disease incidence that occur over a very wide area, cross international boundaries, and affect a great number of people. However, this conventional definition neglects the fact that some diseases that reach a global scale, such as influenza or Severe Acute Respiratory Syndrome (SARS), are usually considered to be pandemics while

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[10] The first cases of covid-19 were reported at research stations in Antarctica in late 2020, and so the pandemic had reached every continent. These cases "brought to an end a year-long period during which Antarctica had been regularly framed as the planet's last substantial covid-19-free zone: a place of 'splendid isolation', the 'final coronavirus-free frontier', 'Earth's one virus-free continent'. Given the popular cultural imaginary of Antarctica as the most remote place on Earth and the most extreme environment for human habitation, it is not surprising that the continent was so readily evoked in terms of refuge, isolation, purity, and resistance to infection" (Leane et al 2023 p110).

other diseases that are similarly widespread, such as tuberculosis, are not" (p1).

Keck (2022) outlined four aspects of pandemics from the viewpoint of social anthropology:

i) They expose vulnerabilities in global connections.

ii) They amplify existing social inequalities.

iii) They "serve as horizons in that they force us to anticipate the future" (Keck 2022 p2) - For example, the importance of pandemic preparedness.
"Pandemics are now imagined through worst-case scenarios as events for which populations must be prepared, in order to contain panic when they do occur. Pandemic planning regulates the distribution of vaccines and treatments that are being stockpiled and secured to avoid looting. Pandemic preparedness is about creating a constant state of vigilance and readiness produced by techniques of anticipation of the future, such as exercises simulating an outbreak of smallpox in the New York City subway. 'Preparedness envisions the future not to predict what is going to
happen but to generate knowledge about the vulnerabilities in the present' (Lakoff 2017...)" (Keck 2022 p7).

iv) They "foreground entanglements of relations between humans and non-human species" (Keck 2022 p2) eg: zoonoses and "animal reservoirs" of infections.

4.4. MISCELLANEOUS

(1) Individuals with a stronger immune response to coronaviruses that cause the common cold-like symptoms prior to 2019 had stronger immune responses to covid-19. Yu et al (2022) analysed blood samples of thirty-two US patients collected between 2016 and 2019. "But the participants with stronger responses against cold-like coronaviruses weren't necessarily less likely to have severe covid-19" (Ricardo da Silva Antunes of Yu et al 2022 quoted in Murugesu 2022a).

(2) There is growing concern about "pandemic terrorism", that is "the ability to take the DNA sequence of a virus from a database, turn it into a living virus

and intentionally infect people" (Le Page 2022a p11).

(3) New and improved covid-19 vaccines will be needed as large numbers of people in the world remain unvaccinated (eg: one-third globally at the end of December 2022), immunity is waning in the vaccinated, and SARS-CoV-2 is evolving (Le Page 2022b).

Future vaccine possibilities include (Le Page 2022b)[11]:

a) mRNA vaccine that provokes an immune response against several coronavirus proteins, not just to the spike protein.

b) Vaccines that inhibit transmission (known as "mucosal immunity") (eg: nasal vaccines). "The mucous membranes of our nose, throat and lungs are where infections typically start and where the viruses that go on to infect people are produced. The hope is that delivering vaccines directly to these membranes - such as via the nose - will stimulate a strong response" (Le Page 2022b p11).

(4) Covid-19 infection occurs between humans and non-humans, but also between non-humans. For example, captive minks on fur farms have infected each other (Satyanarayana 2022).

This led to the creation of a public database of animal-to-animal covid-19 infections ("SARS-ANI Dataset" [12]) (Nerpel et al 2022). As of September 2022, over thirty different animal species had reported cases (Satyanarayana 2022).

4.5. REFERENCES

Bank, C et al (2022) Evolutionary models predict potential mechanisms of escape from mutational meltdown bioRxiv (https://www.biorxiv.org/content/10.1101/2022.06.21.496937v2)

Briggs, C & Mantini-Briggs, C (2003) Stories in the Time of Cholera: Racial Profiling During a Medical Nightmare Berkeley, CA: University of California Press

Doshi, P (2011) The elusive definition of pandemic influenza

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[11] "Mutagenic drugs" are anti-virals (and anti-cancer drugs) that kill viruses by inducing lots of mutations. They produce a "mutational meltdown" (Le Page 2022c). Bank et al (2022) raised concerns that these drugs could result in viruses acquiring changes that would not have happened otherwise. This concern was based on an evolutionary modelling study.

[12] See https://github.com/amel-github/sars-ani.

Bulletin of the World Health Organisation 89, 532-538

        Keck, F (2022) Pandemics. In Stein, F (ed) The Open Encyclopaedia of Anthropology (https://www.anthroencyclopedia.com/entry/pandemics)

        Klein, A (2022) Fewer boys born amid covid-19 New Scientist 8th October, p12

        Kovacevic, A et al (2023) A modelling study on the impact of covid-19 pandemic responses on the community transmission of anti-biotic-resistant bacteria bioRxiv (https://www.biorxiv.org/content/10.1101/2022.08.08.503267v3)

        Lakoff, A (2017) Unprepared: Global Health in a Time of Emergency Oakland, CA: University of California Press

        Leane, E et al (2023) "The only almost germ-free continent left": Pandemics and purity in cultural perceptions of Antarctica Environmental Humanities 15, 1, 109-127

        Le Page, M (2022a) Risk of pandemic terrorism New Scientist 19th November, p11

        Le Page, M (2022b) The next covid-19 vaccines New Scientist 31st December, p11

        Le Page, M (2022c) Mutation-inducing drugs could raise virus dangers New Scientist 3rd September, p11

        Masukume, G et al (2023) Covid-19 induced birth sex ratio changes in England and Wales PeerJ 11, e14618

        Murugesu, J.A (2022a) Other coronaviruses shape covid-19 responses New Scientist 13th August, p9

        Nerpel, A et al (2022) SARS-ANI: A global open access dataset of reported SARS-COV-2 events in animals Scientific Data 9, article 438

        Satyanarayana, M (2022) Covid relay Scientific American November, p18

        Wilson, C (2022a) Why the UK could be heading for a flu-covid "twindemic" this winter New Scientist 8th October, p13

        Wong, C (2022b) Sub-variant "soup" may drive wave New Scientist 5th November, p11

        Wong, C (2023) Covid-19 pandemic linked to anti-biotic resistance in pneumonia bacterium New Scientist 25th February, p14

        Yamasoba, D et al (2023) Virological characteristics of the SARS-CoV-2 omicron XBB.1.16 variant Lancet Infectious Diseases 23, 6, 655-656

        Yu, E.D et al (2022) Immunological memory to common cold coronaviruses assessed longitudinally over a three-year period pre-covid-19 pandemic Cell Host and Microbe 30, 9, 1269-1278

5. COVID-19 AND RELIGION

5.1. INTRODUCTION

Religion can be defined as "a structure comprised of known tenets, observances, stances, ethics, and aspirations, which enable cynosure, guiding or motivating purpose, as well as strategies for religious coping... Moreover, religion is overwhelmingly social; enacted and transmitted in the context of the religious community wherein individuals influence and are influenced by the collective" (Bankier-Karp et al 2022 p200).

The impact of covid-19 upon religion can be seen in two particular ways – the effect of beliefs and mental health, and the pandemic response policies and religious meetings.

5.2. GENERAL RELIGION

As the covid-19 pandemic developed, scientific and medical recommendations were made to mitigate the risk of infection. Most individuals followed advice, but a small number of people chose alternatives (ie: in opposition to scientific and medical advice and/or with no supporting evidence of effectiveness), or complemented medical advice with other behaviours. Corcoran et al (2022) investigated the use of religion in relation to medical advice.

Covid-19 was a negative event, and religion helps individuals cope with such circumstances (eg: praying; reading sacred texts; seeking advice from spiritual leaders). Membership of a religious group may also influence behaviour viewed as "moral" or "political". For example, US conservative Christians reported less adherence to advice like mask-wearing, and more opposition to government restrictions than other groups (Corcoran et al 2022).

Corcoran et al (2022) presented two possibilities for the relationship between religion and medical advice:

i) A negative belief – eg: the belief that God will protect them and so no need for a covid-19 vaccine.

ii) A positive relationship – eg: the belief that God works through medical authorities and so obedience to medical advice is obedience to God.

Data were analysed from the "AmeriSpeak panel" (a random sample of 50 000 individuals aged thirteen years and above in the USA). Specifically, 2003 individuals were surveyed in late May 2021. Nine items were particularly relevant to this study, including: "I have prayed for the covid-19 pandemic to end", "I have read religious texts to better understand the covid-19 pandemic", and "I have worn a mask to protect myself from covid-19". Three categories of behaviour were distinguished from the items – "prayer-related covid-19 responses", "religious resource-based covid-19 responses", and "medically recommended covid-19 responses". Eight categories of religious tradition were measured – Evangelical Protestant, non-Evangelical Protestant, Catholic, Non-Christian, Agnostic, Atheist, nothing in particular, and something else. Other questions were asked about service attendance, reading the Bible, "Christian nationalism" (ie: belief that USA is a Christian nation), political party affiliation, and socio-demographic characteristics.

Overall, the mean "medically recommended covid-19 responses" score was 3.48 (out of 5) (which converts into "sometimes"/"often"), 2.36 ("rarely/"sometimes") for the "prayer-based covid-19 responses", and 1.38 ("never"/"rarely") for "religious resource-based covid-19 responses".

It was found that there was a positive association between religion and medical advice adherence. "This suggests that religious people who are concerned about covid-19 are willing to use whatever strategies are available to them both religious and medically recommended... This is important because it means that religious responses to covid-19 are not replacing medically recommended responses" (Corcoran et al 2022 p308).

But there was an exception – "Christian nationalists". "While they are significantly more likely to engage in religious responses to covid-19, they are significantly less likely to engage in medically recommended responses. This may be because Christian nationalists believe that God will protect Americans if they defend their Christian identity as a nation and

uphold biblical principles... Christian nationalists believe 'the solution to the crisis is not to take behavioural precautions like hand-washing, mask-wearing, or social distancing, but to increase America's collective devotion, attending religious services and repenting of national sins (eg: abortion, homosexuality, general lawlessness)' (Perry, Whitehead, and Grubbs 2020...)" (Corcoran et al 2022 p308).

Political party affiliation generally also predicted adherence to medical recommendations, with Republicans less likely to wear masks, and social distance.

The data were collected at one point in time, mostly online (vs by phone), from volunteers on a survey panel, and using a limited number of questions about religious-related and covid-19-related behaviours.

In another study with US data, Schnabel and Schieman (2022) found that "it appears religion protected mental health but endangered physical health during the covid-19 pandemic" (p530). The data were collected in one week in March 2020 (shortly after the covid-19 pandemic was declared) from over 11 500 adults on Pew Research Centre's "American Trends Panel".

Five items covered mental distress (eg: "felt depressed") in the past week, four items on the pandemic as a threat (eg: "your personal health"), six items on public reaction (eg: "over-reacting to the outbreak"), and questions about health-related behaviours (eg: not travelling abroad).

Overall, respondents who attended religious services more frequently reported lower mental distress scores, with evangelical Protestants the least distressed of religious groups, and Jewish and secular Americans most distressed. Usually, there is a U-shaped relationship, where "actively religious and secular people have comparatively better mental health than somewhat religious but largely uninvolved and disengaged people" (Schnabel and Schieman 2022 p536). So, a positive benefit for mental health from religion in the early days of the pandemic.

But more frequent religious service attenders viewed covid-19 as less of a threat to themselves and the nation, were less likely to support public health restrictions, and viewed the public as over-reacting.

These views were entangled with political affiliations with more religious individuals being conservative and Republican as a rule. So, a negative side to religion. "Highly religious people and especially evangelicals tended to hold attitudes that ran

counter to the policy recommendations of public health officials aimed at curbing the spread of covid-19" (Schnabel and Schieman 2022 p538).

Other research (eg: Hill et al 2020) found that "stay at home orders" were less effective in reducing population movement in US states classed as more religious. "Stay at home orders, when actually followed, endanger mental health by disturbing routines, exacerbating financial uncertainty, and disrupting social connectedness. But they are also a key strategy for containing spread and protecting physical health. Paradoxically, therefore, it seems religion protected mental health but endangered physical health. While intensely religious Americans experienced comparatively less distress, more secular Americans faced elevated distress while embracing public health measures, thereby endangering their own mental health to protect the physical health of those around them" (Schnabel and Schieman 2022 p541).

The researchers accepted that the survey occurred early in the pandemic before most individuals had experienced the impact of covid-19. Schnabel and Schieman (2022) explained: "It is likely that some religious partisans experienced increased distress when faced with tangible evidence that the virus is a threat such as getting sick themselves or losing loved ones. Yet as long as religion continues to provide a sense of comfort, support, and hope — and remains entangled with politics that reduce concern about and isolating action to address the pandemic — religious people will likely retain at least some of the mental health benefits..." (p541).

Social support from congregational members, including the opportunity to share personal problems, has a positive impact on mental health. Jacobi et al (2022) investigated this relationship specifically in relation to the pandemic in the USA. Over 1100 adults from five different faith groups (Catholic, Jewish, African American Baptist, Mormon, and Hindu) were surveyed online in laate 2020. The main outcome measure was mental health during the pandemic, and the explanatory variables were sharing problems, social support, service attendance before covid-19, and importance of religion to life.

The average level of mental health reported was high (mean 7.4 out of 10 (where 10 = "excellent")), and few respondents (13%) had a worsening during the pandemic. Less than 8% of respondents shared their problems "very often" with congregation members (figure 5.1). However, there was a significant relationship between sharing and

positive mental health overall, and "never" sharers were more likely to report worsening mental health during the pandemic. The positive relationship was enhanced by feeling social support generally from the congregation, and service attendance prior to the pandemic.
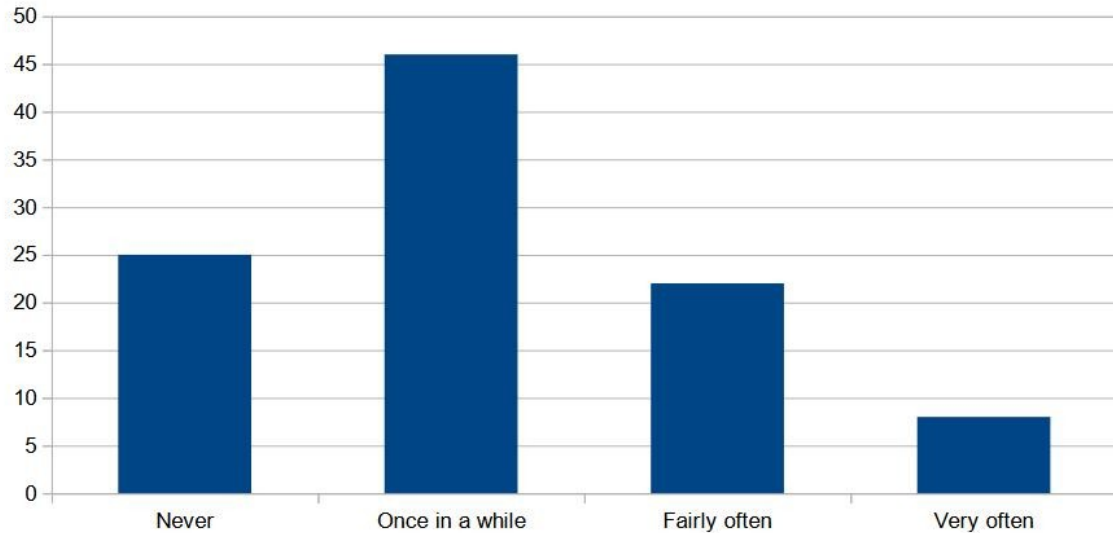
(Data from table 1 p556 Jacobi et al 2022)

Figure 5.1 – Frequency of sharing personal problems with congregation (%).

Jacobi et al (2022) observed: "Congregational differences in norms and practices around vulnerability and self-disclosure may also affect the level of emotional support that individual members experience. Certain religious traditions and congregations may provide more settings and groups in which members regularly ask for prayers for specific problems and in turn receive prayer or advice from others. Talking about problems in such contexts would not create negative effects of such disclosure..., but would instead be met with hope and encouragement" (p561).

The sample was self-selected from twelve congregations in four US States (Washington DC, Maryland, Virginia, and Texas), and the typical respondent was "a married, White, relatively older, highly educated, and high-income woman who also tends to be highly religious and active in the congregation" (Jacobi et al 2022 p555). Around 40% of the sample was Catholic, and one-quarter Jewish.

Other limitations included a lack of information

about problem sharing outside of a religious context, the
type of problems shared with the congregation, and
single items to measure certain behaviours, while a
longitudinal study may be able to establish causality.

Jacobi et al (2022) recommended that "future
research should take in consideration the potential
negative outcomes when people are in relationships and
networks characterised by uneven exchange
of problem sharing... Specifically, when a high ratio of
receipt-to-provision exchange of problems is experienced,
this is associated with dependence, and a high ratio of
provision-to-receipt exchange of problems signifies
support burnout and exploitation of the supporter"
(p562).

5.2.1. Congregation Shopping

The appearance of online congregations during the
pandemic, and the differences in reopening of physical
spaces in the USA has the potential to increase
"congregation shopping" (CS). "The United States already
had a market-driven religious system before the pandemic
that encouraged individualism and ate at the once long-
term congregational bonds reinforced by the community and
family... Any practice, such as online worship, enabling
easier comparisons as well as organisational exit outside
of social accountability could increase the further
fraying of congregational attachments and augment the
importance of individual comforts in decision-making.
This was a great fear, that the pandemic would undermine
American religious life, not just through the lack of
social engagement, but through a new religious market in
hyperdrive" (Higgins and Djupe 2022 p727).

Higgins and Djupe (2022) analysed data from October
2020 collected from 1790 adults as part of the "General
Social Survey". The key questions were, "Have you visited
another congregation in person or online in the past 6
months?", and "Are you still attending the same house of
worship you were attending in the Spring of 2020?".
Political support for the President (Donald Trump) was
also measured.

Around one-third of respondents reported CS in the
previous six months. This was higher than data from pre-
pandemic, though direct comparisons are not possible
(Higgins and Djupe 2022).

Trying to understand the behaviour, Higgins and
Djupe (2022) observed: "Shopping of any kind is an active
behaviour that takes motivation, among other things.

Therefore, one of the most intriguing findings... is that shopping was more common among those who reported attending at higher rates. These would typically be the most satisfied and involved congregants, but, apparently, that also signifies the motivation to see what colour the grass is in other pastures" (p731). Those attending larger congregations usually that had stopped in-person meetings were more more likely to CS, among with a "more individualistic religious worldview, represented by the prosperity gospel and identifying as non-denominational" (Higgins and Djupe 2022 p731).

Higher educational was also associated with more CS, which Higgins and Djupe (2022) took as "a measure of resources as well as the personality trait of being open to an experience that would fuel..." (p731) CS. Women were less likely to CS, and there was no relationship with political affiliation.

CS was not the same as leaving the congregation, but CS facilitated leaving depending on the relationship with the current congregation, argued Higgins and Djupe (2022). Weak relationship to the congregation (as measured by below average attendance at services) was impacted by more disagreement with Trump in terms of leaving. "Among higher-than-average attenders, the proportion who left their congregation was constant, whether they shopped or not, and regardless of experiencing political disagreement. This is consistent with prior findings that high commitment suggests there are sufficient bases for maintaining membership independent of political differences" (Higgins and Djupe 2022 p733). The researchers accepted that individuals may leave a congregation for reasons other than political differences.

5.3. JUDAISM

Bankier-Karp et al (2022) studied the Orthodox Jewish community in the USA, who faced a specific problem during lockdown – the "unique requirements for and reliance upon in-person prayer services. Orthodox Jews are a denominational group distinguished by adherence to halakha, the system of religious laws regulating ritual observances and general conduct. While electronically mediated services are deemed acceptable for most religions and non-Orthodox Jewish denominations, Orthodox Jews do not sanction their use on the Sabbath or Festivals, nor is prayer conducted during such a service considered to fulfil the imperative of congregational

prayer with a minyan, or quorum" (Bankier-Karp et al 2022 p198). However, membership of such a group provides support (economic and psychological), or "resources" [13]. Aronson (2022 quoted in Bankier-Karp et al 2022) reported in a survey of US Jews that Orthodox participants were "less likely to have experienced economic distress as a result of the pandemic, more likely to have indicated to the highest degree that 'being Jewish helps cope with crisis', that a Jewish organisation offered them help, that they had been invited and had participated in online programmes" (Bankier-Karp et al 2022 p199).

Bankier-Karp et al (2022) analysed data from the "Covid-19 Community Portrait Study" (CPS), which surveyed members of eleven Orthodox Jewish synagogues in four regions of the USA at three times during the pandemic (July, August, and October 2020) (n = 942 participants who completed all three surveys). Questions were related to mental health, "religious psycho-social resources" (eg: "Find strength or comfort in religious observance" [14]), group religious observance, and religious beliefs (eg: "How has the coronavirus outbreak affected the way you think and feel about God?"), for instance.

The researchers summed up the main finding that "as the local population stayed home more, there were two competing effects on the religious resources of Orthodox Jews. Group resources (ie: praying with a minyan) decreased, but psycho-social resources (ie: existential meaning and closeness to God) were strengthened" (Bankier-Karp et al 2022 p208).

Around a quarter of respondents reported that their faith had strengthened during the pandemic, 40% that there was no change, and 15% that their faith was challenged [15]. These percentages were based on the categorisation of open-ended responses, and so there was a number of responses that did not fit the three categories. For individuals whose faith had strengthened, phrases were used like "God runs the world", and "made my sense of Hashem (God) and His presence with me more palpable and strong" (p208). Comments from those who faith was challenged included, "How could God allow something like this happen?", and "One wonders if it's a punishment, if so for what?" (p208).

Stronger perceived faith was associated with lower

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[13] Resources can be group (ie: physical support from group members), social identity (ie: psychological support from being a member of the group), and psycho-social (ie: psychological support from religious beliefs) (Bankier-Karp et al 2022).

[14] The researchers created a "Closeness-to-God index" from such questions.

[15] A general survey in the USA in April 2020 found that a similar number reported a strengthening of their religious faith compared to 2% a weakening (Gecewicz 2020 quoted in Bankier-Karp et al 2022).

anxiety and depression, perceived stress, and loneliness scores. Bankier-Karp et al (2022) made this overall statement: "This study demonstrates that psycho-social and social identity resources which are bound up in belonging to an Orthodox Jewish community protect against decreased mental health and well-being, even as group resources were curtailed by the pandemic" (p211).

The researchers explained the findings thus: "Premised upon the assumption that those unable to participate in congregational prayer did pray alone in their homes, it is possible solitary prayer, said at one's own pace and untrammelled by interruption and distraction, may have enabled communion with God that proved inspiring. It is also highly possible that beyond practical support which may have been offered, religious leadership shared philosophical beliefs which empowered people to make sense of their experiences in ways that supported more effective coping" (Bankier-Karp et al 2022 p2011).

5.3.1. Reform Jews

Reform Jewish congregations have more positive attitudes towards technology because they "permit using electricity on Shabbat and holidays, so they were able to respond to this new reality and allow prayer online" (Ben-Lulu 2021 p853).

Ben-Lulu (2021) observed ten virtual services between March and September 2020, and interviewed thirty Rabbis and congregants in Israel. The move online initially meant the physical space (ie: the synagogue building) was no longer visited but viewed on a screen. Subsequently, the services were broadcast from the homes of the Rabbis. "As a result, the symbolic and representational work of the temple became more complex in the virtual space due to the absence of the Torah ark and the prayer books (siddurim)" (Ben-Lulu 2021 p858). "Rabbi Dafni-Kellen" explained the changes: "Reinventing the prayer each and every time, the attention in front of a screen is different. The experience is more difficult and poorer visually and acoustically. It always focuses on how I make you understand that you are praying and not just watching me pray. For example, in the Amidah prayer, will they watch me standing? We put an image of our Torah ark or something inspiring in the background that people will pray in front of it" (p858).

"Lilach" described the online experience as "a tortoise without armour" (p858). She said: "Praying

outside the synagogue is weird. It is not really a prayer but a lecture about religion, or even like listening to Jewish songs on YouTube. I need a physical place, to move in the space, to feel the atmosphere, to touch the prayer book – the Siddur –which I don't have at home, and not to be lying down on the sofa" (p858).

Another change related to the ceremonial bodily gestures normally performed in the physical space. "Tali" described her experience thus: "All of a sudden, I found myself closing my eyes and saying Shema Yisrael in front of the computer screen. Then, I removed my hand, which covered my eyes, and caught someone doing a 'Like' gesture for the broadcast. I felt a kind of embarrassment. In Shema Yisrael, I am used to connecting to myself and not to the network, trying to disconnect as much as possible from unholy things, and suddenly I open my eyes and see likes and comments from people on the screen. It's weird. A week later, I decided I am not putting my hand up anymore (during Shema prayer). Then, I also decided that there was no point in standing up in the prayers like I used to or to bow down. I just sat in front of the computer and drank a cup of coffee. But, I did click the 'share' button in the community's Facebook page as an act of support and to show people that there is another option to pray" (p861).

"Rabbi Dafni-Kellen" outlined another problem: "It is impossible to smell or taste during a virtual prayer. How should one bless the Ha'gefen (wine) and the Challah (bread)? So, we asked the members of the community to fill a Kiddush glass and have a drink with us, but it is not the same. It turns out that each one is for himself, even though in the heart we are all together. I don't know how to explain it, but when everyone is slicing the same Challah it has a different communal meaning" (p861).

From a different point of view, "Dean" (a a-binary transgender person) found the online experience positive: "I still feel uncomfortable with my identity and who I am in the world. People know I am still figuring out my gender continuum, but I still do not feel whole. It puts me in a place where I'm being naked and 'seen' – to me it is embarrassing because I still have shame and feel the pressure of the expectation to say how to approach me (language, female or male). I get stressed and it does not run naturally since it is felt in the air and I walk away. There is concealment, as if the body would create an ugly hybrid and there is something to hide and be ashamed of. In the Zoom meeting, you only see people's heads so the concealment dissolves and I don't have to be ashamed of my trans visibility. Prayer in the virtual

space actually calms my anxiety regarding human encounters. There is more distance from the face-to-face meeting and it is more comfortable for me. Therefore, for me, there's a closeness in the virtual meeting" (p862).

Ben-Lulu (2021) concluded that "although Reform congregations are taking advantage of the digital revolution, most people still want a place to gather with others. The virtual space is a solution for this difficult time of a global pandemic and will be sufficient until the crisis is over, but for many, it cannot be used for long" (p867).

Note that the move to religious service online generally has been occurring prior to the pandemic, and had been observed since the 1990s with "cyber-churches" and "godcasting", for example (Ben-Lulu 2021). Also Holland (2000) distinguished between "Ritual Online" and "Online-Ritual". "The term 'Ritual Online' refers to ritual texts, prescripts, or descriptions mainly found on websites whereas the ritual itself is performed in an offline scenario. In contrast, the term 'Online-Ritual' refers to rituals performed online. This means that the term focuses on activities performed in a virtual space" (Ben-Lulu 2021 p855).

5.4. ISLAM

Jones and Menon (2022) looked at trust in religious leaders and compliance with social distancing rules. Religious leaders exert influence in many societies, and so if they back government regulations, then the population will comply in theory. But religious leaders may not advise to stay at home, say, when this means not attending religious services (Jones and Menon 2022).

Jones and Menon (2022) analysed data from Kazakhstan and Kyrgyzstan, which are predominately Muslim countries, with centralised religious bureaucracies. Quarantine and social distancing policies were introduced in mid-March 2020, and continued during Ramadan (April-May). Five hundred adults were interviewed in each country by telephone in July 2020. Questions were asked about compliance with social distancing regulations, particularly in relation to religious festivals, trust in political and religious leaders, and perceived risk of covid-19 infection to self. Adherence to social distancing regulations was scored 0-3, and trust as 1-4.

"In Kazakstan, higher trust in religious leaders is both positively and consistently associated with the adoption of social distancing behaviours across all

religious holidays and rituals" (Jones and Menon 2022
p593). In other words, individuals altered their
behaviour, and the difference was up to twice as high
between high and low trust individuals.

In Kyrgyzstan, there was not a positive relationship
between trust and social distancing overall, with some
exceptions. The researchers were puzzled by the
difference between the countries which was not expected.
So they analysed the statements concerning the
government's social distancing policies made by religious
leaders, as reported on the national news media.

There were many similarities in the general
messaging in both countries (eg: to refrain from mass
gatherings during Ramadan). But in Kazakhstan the
religious leaders made recommendations for alternative
behaviours during Ramadan - "to hold meals to break the
fast (iftars) only at home with family members, excused
frontline workers from fasting, created an online payment
system for Muslims to make donations (zakat al-fitr) that
are usually received in the mosque, and gave permission
for Muslims to read alternative prayers at home in lieu
of attending mosque to hear sermons and participating in
communal prayer, as is customary, on Oraza Ait (Eid al-
Fitr) to celebrate the end of Ramadan" (Jones and Menon
2022 p597). The "Grand Mufti" (Islamic leader) in
Kazakhstan, for example, "emphasised that, according to
the Sharia, quarantine was not only appropriate 'to stop
the spread of the disease' but also required because
'[o]ur prophet strictly ordered us not to bring harm to
ourselves or to the people around us'" (Jones and Menon
2022 p598).

There may have been other differences between the
two countries that explained the relationship between
trust and compliance with social distancing, and the
researchers accepted that their analysis of the news
media was limited, but the key difference was that "by
offering both practical and spiritual solutions to
mitigate the individual costs of abstaining from
proscribed practices, religious leaders in Kazakhstan
demonstrated that they were committed to acting in the
interests of their adherents" (Jones and Menon 2022
p599). So, trusted leaders need to give definite
suggestions to change behaviour in the desired direction.

5.5. REFERENCES

Bankier-Karp, A.L et al (2022) Covid-19's effects upon the
religious group resources, psycho-social resources, and mental health
of Orthodox Jews Journal for the Scientific Study of Religion 61, 1,

197-216

Ben-Lulu, E (2021) Zooming in and out of virtual Jewish prayer services during the covid-19 pandemic Journal for the Scientific Study of Religion 60, 4, 852-870

Corcoran, K.E et al (2022) Individuals' use of religion in response to the covid-19 pandemic as complementary to their use of medically recommended responses Journal for the Scientific Study of Religion 61, 2, 293-313

Higgins, N.J & Djupe, P.A (2022) Congregation shopping during the pandemic: A research note Journal for the Scientific Study of Religion 61, 3-4, 726-736

Hill, T et al (2020) The blood of Christ compels them: State religiosity and state population mobility during the coronavirus (covid-19) pandemic Journal of Religion and Health 59, 5, 2229-2242

Holland, C (2000) Religion online/online religion and virtual communitas. In Holland, C et al (eds) Religion on the Internet: Research Prospects and Promises Amsterdam: Elsevier Science

Jacobi, C.J et al (2022) Mental health correlates of sharing private problems in congregations during the covid-19 pandemic Journal for the Scientific Study of Religion 61, 2, 553-563

Jones, P & Menon, A (2022) Trust in religious leaders and voluntary compliance: Lessons from social distancing during covid-19 in Central Asia Journal for the Scientific Study of Religion 61, 3-4, 583-602

Perry, S.L et al (2020) Culture wars and covid-19 conduct: Christian nationalism, religiosity, and Americans' behaviour during the coronavirus pandemic Journal for the Scientific Study of Religion 59, 405-416

Schnabel, L & Schieman, S (2022) Religion protected mental health but constrained crisis response during crucial early days of the covid-19 pandemic Journal for the Scientific Study of Religion 61, 2, 530-543