Preventative Emergency Response (PER) Project 2020-2021: University of Lincoln Students and Covid-19

James Cronin[1], Hannah Beech[1] and Clare Cotton[2]
[1]PER Project research students, School of Psychology, University of Lincoln
[2]Lincoln Academy of Learning and Teaching (LALT), University of Lincoln

Abstract

The Preventative Emergency Response (PER) Project investigated the knowledge, attitudes and behaviours of University of Lincoln students towards Covid-19 during the 2020-2021 coronavirus pandemic. Responses from the second and final Qualtrics questionnaire survey of 427 individuals were analysed in SPSS, with open-text responses undergoing a thematic analysis of content. Consistent with findings from the initial survey conducted earlier, and also reported in this journal, almost all respondents reported following the news about Covid-19 closely as well as being likely to adhere to most safety measures effectively, thereby protecting themselves and others in the Lincolnshire community. Student knowledge performance was lower than previously indicated but this may be accounted for by the more involved and challenging questions in response to changing requirements. Thoughts on returning to normality focussed mainly on tentative approval or ambivalence, with consistent concerns about a fear of self-isolation or the cynicism of adherence of others to safety measures also expressed. Most respondents described the digital resources developed to help students throughout the Covid-19 pandemic as 'good' but with reservations. As penetration of the digital resources into the student community was limited, caution is advised regarding conclusive statements about their overall usefulness. Additional implications for future research are discussed.

Keywords: Covid-19, student knowledge, student attitudes, student behaviours, digital resources, personal safety, community safety

Introduction

Run jointly with New Media Lincs in the Lincoln School of Film and Media, Digital Education and Student Life, and colleagues in LALT, LHERI, Student Services, Careers, Alumni Relations and the Student Union, the Preventative Emergency Response (PER) Project was funded by the Lincolnshire Community Foundation during the 2020-2021 Covid-19 coronavirus outbreak. In addition to creating a range of student-created digital resources, the PER Project aimed to explore the knowledge, attitudes and behaviours of University of Lincoln students towards Covid-

19 to help protect themselves and others and to reduce the risk of the virus spreading within the wider Lincolnshire community.

Students were invited to take part in an initial PER survey via Student Life social media channels, banners on School Blackboard pages and the university's home Blackboard page. Schools were also encouraged to promote the survey via College Directors of Education and Student Engagement Leads. The initial survey questionnaire, reported in December 2020 with respondents in lockdown, was formulated in Qualtrics from a review of available research literature and in consultation with a small number of student focus groups (Sharp et al. 2021). The final report, completed in July 2021 and presented here, including an evaluation of the digital resources developed to help, records findings from the follow-up survey conducted similarly with university students still in lockdown. Ethical approval for the project was obtained prior to commencement (Code: 2021_3877). As a continuation of the preceding PER Project work, the follow-up survey was guided by two overarching research questions:

- What was the state of student knowledge and attitudes and behaviours towards Covid-19 during the coronavirus pandemic at the time of study?
- How had all of this changed since the initial survey and throughout the course of the pandemic over time?

Overall, 1,299 questionnaires were returned at the specified closing date of the follow-up survey (7 May 2021), with a final sample of 427 accepted after excluding largely incomplete returns and questionnaires clearly displaying unusual response patterns throughout (the online survey was, in fact, attacked by a bot rendering the majority of responses ineligible). The 32.9% of usable responses from the overall return was considered entirely satisfactory and comparable to the sample size from the initial survey. 23 missing item scores were inserted to get a full and complete data set from the 39,711 responses possible (0.06% of the data as a whole). This was achieved using pattern and trend analysis or by inserting a neutral response where no pattern or trend was discernible. All quantitative data analysis was undertaken using SPSS. Free-text responses were coded for content and analysed thematically.

Summary of findings

Demographic background, community attachment and information sources

As indicated (Table 1), the majority of students who responded to the survey were women (68.6%), registered within the College of Science (57.4%) and taking courses leading to the award of BSc (59.3%). All undergraduate years of study were well represented, together with a small number of postgraduate students taking master's and doctoral awards. Ages ranged from 18-60 years with a mean of 21.0 (SD = 4.36). As might have been expected, the majority were also White British, UK domiciled and living in private and rented accommodation or student halls of

residence, with many continuing to work under different circumstances to earn money while studying.

Variable	Response	Frequency	%
Gender	Female	293	68.6
	Male	113	26.5
	Other	21	4.9
College	Science	245	57.4
	Social Science	97	22.7
	Arts	75	17.6
	LIBS (Business School)	10	2.3
Course designation	BSc	253	59.3
	BA	86	20.1
	MSc/MA/MEng/Other	42	9.8
	Doctorate	15	3.5
	Foundation / CertHE	11	2.6
	BEng	8	1.9
	BMBS	6	1.4
	Other	6	1.4
Year of Study[1]	Year 2	135	32.5
	Year 3	125	30.0
	Year 1	99	23.8
	Postgraduate	47	11.3
	Year 4	10	2.4
Status	UK Domiciled	371	86.9
	EU	35	8.2
	International (non-EU)	21	4.9
Residence	Private rental	193	45.2
	Student halls	150	35.1
	Living with family (Permanently)	41	9.6
	Paying for accommodation but living with family	35	8.2
	Homeowner	8	1.9
Employment Type	Not employed	273	63.9
	Employed (working normally)	99	23.2
	Employed (working from home)	31	7.3
	Employed (Furloughed)	24	5.6
Age[2]	18-21	304	72.6
	22-25	68	16.2
	26+	47	11.2
Ethnicity	White	384	89.6
	Asian	12	2.8
	Black	11	2.6
	Mixed	8	1.9
	Not Specified	12	2.8

Table 1: Summary of respondent demographic (n=427; n=416[1], n=419[2])

Interestingly, though perhaps not surprisingly, only a small number of respondents felt a part of the student community at university during lockdown (21.3%). This figure reduced even further when considering the wider Lincolnshire community (16.7%). Those that had returned home but were still paying rent for accommodation in Lincoln were the least likely to feel a part of both.

Most respondents reported followed the coronavirus pandemic via reports on social media (64.9%), though obtaining information from traditional news formats (e.g. the TV and newspapers) was still popular (50.6%).

Covid-19 test outcomes, vulnerability and vaccination status

16.0% of respondents reported having already tested positive for Covid-19 and within 3 to 6 months of competing the survey in the main. 77.5% of respondents reporting knowing of a friend or relative who had also tested positive for Covid-19. 67.7% of respondents were neither a member of a vulnerable group nor lived with someone who was (Table 2).

Question	Yes - Self Frequency (%)	Somebody Else Frequency (%)	Yes - Self and Somebody Else Frequency (%)	No Frequency (%)
Are you vulnerable or live with somebody who is?	32 (7.5)	87 (20.4)	19 (4.4)	289 (67.7)

Table 2: Vulnerability (n=427)

20.1% of all respondents had already been vaccinated at least once. Respondents considering themselves to be vulnerable were also more likely than others to have received a vaccine at time of survey completion. This group were also the least likely to have previously tested positive for Covid-19.

Perceived impact of the Covid-19 pandemic measures on attainment

61.4% of respondents perceived the Covid-19 pandemic as having negatively affected their academic attainment. Conversely, 19.7% perceived the pandemic to have had a positive effect. 19.0% were neutral in their view.

Knowledge about Covid-19 and recommendations

In contrast to the initial survey in 2020, with over 90.0% correct responses in many instances, student performance on the knowledge questions at follow-up were lower overall, but set against a dynamic climate of changing regulations and guidance and a more rigorous exploration (Table 3). While most respondents were aware of the definitions of terms like incubation period (75.9%) and support bubble (73.5%), far fewer were up-to-date in their knowledge of the self-isolation period at the time of the survey (51.5%) or how wearing a face mask inhibits viral spread (37.9%).

The majority of respondents accurately identified inhalation of infected respiratory droplets to be the primary mode of transmission of Covid-19 (85.9%), but only a little over half were correct in identifying air transportation as the vector (53.3%). About a third were correct in acknowledging any contact with bodily fluids (30.7%). A small

but appreciable number of respondents also held incorrect and alternative views (Table 4).

Question Summary	Correct (%)	Correct Answer at the time of survey	Commonest Alternative (%)
What is meant by incubation period?	324 (75.9)	Period of time from virus exposure to symptom onset.	Period of time of ability to transmit the virus (14.8).
What is the definition of a support bubble?	314 (73.5)	Someone who lives alone (or just with their children) can meet people from 1 other household.	Where a household can meet with one other household (13.8).
What is the incubation period of Covid-19?	248 (58.1)	2-14 days (average = 5 days).	1-7 days (25.1).
Recommended self-isolation period is...?	220 (51.5)	10 days.	14 days (39.3).
How do face coverings reduce spread?	162 (37.9)	By reducing your ability to spread your own droplets.	By reducing exposure to the droplets of others and spreading your own (53.2).
Covid-19 can remain in air for how long?	133 (31.1)	3 hours.	Don't know (43.1).

Table 3: Covid-19 Recommendations knowledge (n=427)

Mode of Transmission	Frequency (%)	True/False
Inhaling respiratory droplets from an infectious/infected person	367 (85.9)	True
Transported or carried through the air (airborne)	228 (53.3)	True
Contact with bodily fluids	131 (30.7)	True
Skin-to-skin contact	105 (24.6)	False
Food contamination	43 (10.1)	False
Carried by water	42 (9.8)	False

Table 4: Mode of transmission (n=427)

Importantly, more students who had previously tested positive for the virus were correct in identifying both the recommended self-isolation period and the virus's incubation period than those who had not.

Adherence to safety: Protecting self and others from Covid-19

Overall, respondents reported being likely to engage in active personal and social behaviours which would indeed help protect themselves and others and reduce the spread of Covid-19 effectively (Table 5). By far the most frequently endorsed

behaviours involved personal hygiene including mask wearing in public buildings (95.3%), using hand sanitisers (80.8%), washing hands (80.3%) and social distancing (75.2%). However, and understandably, relatively large numbers of respondents were also likely to break lockdown rules to socialise with family (33.3%), to see friends (32.1%) or to see a partner (24.3%). Only relatively small number of respondents said they would report a stranger for attending an illegal party (18.5%) but, and with the additional constraint that they were known to have Covid-19, this more than doubled (43.5%).

Behaviour	Unlikely Frequency (%)	Neither Likely nor Unlikely Frequency (%)	Likely Frequency (%)
Wear a mask where required (e.g. university library)	13 (3.0)	7 (1.6)	407 (95.3)
Get an asymptomatic test via the university before using university facilities.	34 (7.9)	43 (10.1)	350 (82.0)
Use hand sanitiser before touching surfaces or paying in a shop.	33 (7.8)	49 (11.5)	345 (80.8)
Wash hands after coming in from outside (e.g. from shops).	43 (10.1)	41 (9.6)	343 (80.3)
Carry hand sanitiser when leaving home.	63 (14.8)	42 (9.8)	322 (75.4)
Meet a friend outside whilst maintaining social distance.	98 (23.0)	49 (11.5)	321 (75.2)
Avoid touching your eyes, nose or mouth	112 (26.2)	108 (25.3)	207 (48.5)
Wash a reusable mask after every use.	158 (37)	59 (13.8)	210 (49.2)
Wash hands after handling a mail package.	155 (36.3)	80 (18.7)	192 (45.0)
Report someone you know to have Covid-19 for going to a party.	147 (34.4)	94 (22.0)	186 (43.5)
Break lockdown rules to see family.	203 (47.5)	82 (19.2)	142 (33.3)
Ask a friend not to go to a party they've been invited to.	170 (39.9)	116 (27.2)	141 (33.0)
Go to a friend's house to hangout.	207 (48.4)	83 (19.4)	138 (32.1)
Break lockdown rules to see partner.	234 (51.8)	85 (19.9)	108 (24.3)
Report someone you do not know for going to a party.	251 (58.6)	97 (22.7)	79 (18.5)

Table 5: Adherence to personal, social and community safety (n=427)

Changes in student behaviours since the initial survey

Generally, while the majority of students indicated an increased adherence to safety behaviours since the initial survey, other behaviours also changed too (Table 6). Proficiency for online software for learning was high (81.0%). Those attending work as normal were far more likely than those working from home or furloughed to report using disinfecting wipes or bleach. Similarly, they were also much more likely to report washing their hands more regularly. More mixed and worrying findings were

discovered for whether students would be more likely to seek out their GP for health concerns unrelated to Covid-19.

Although many reported being less likely to get involved with in-person group activities since the pandemic began, an appreciable number would still participate fully. Those living at home with family were the least likely to participate in group activities, and those in student halls the most likely. Responses that reported being more likely to maintain or start a relationship were low but significantly and positively associated with being more likely to go to a friend's house.

About half of respondents reported adopting a new hobby during the pandemic with over sixty different examples given. The most frequently reported related to exercise or sports, with yoga and running and arts and crafts also proving particularly popular. Other common hobbies included gaming and learning a new instrument or language.

Behaviour	Unlikely Frequency (%)	Neither Likely nor Unlikely Frequency (%)	Likely Frequency (%)
Be more proficient with online software for learning (e.g. MS Teams)	23 (5.4)	58 (13.6)	346 (81.0)
Talk with friends/family using video calling	32 (7.5)	60 (14.1)	335 (78.5)
Clean using disinfecting wipes/bleach (e.g. kitchen counters)	25 (6.0)	83 (19.4)	319 (74.7)
Maintain a relationship with somebody	124 (29.0)	105 (24.6)	198 (46.4)
See your GP (for something besides Covid-19)	133 (31.2)	109 (25.5)	185 (43.3)
Engage in group social activities in person	147 (34.4)	119 (28.9)	161 (27.7)
Pay using cash	257 (60.2)	101 (23.7)	69 (16.2)
Start a new relationship with somebody	241 (56.5)	121 (28.3)	65 (15.2)

Table 6: Behavioural changes since initial survey (n=427)

Attitudes towards and perceived efficacy of safety measures

In perhaps the most interesting and telling part of the survey with respect to the funder's brief, attitudes towards the perceived efficacy of safety measures were largely positive in many key respects but mixed in others (Table 7). Self-isolation received the greatest support (79.6%), with vaccine programmes also endorsed as extremely efficacious if surprisingly falling in behind (75.6%). Openness to receiving a vaccine was negatively associated with the perceived efficacy of vaccinations. Behaviours which received more moderate endorsements of efficacy included what may be described as more elaborate or difficulty in monitoring, such as avoiding touching your face, disinfecting surfaces in the home and avoiding high-traffic surfaces (e.g. elevator buttons in lifts and door knobs). That few respondents only

issued tentative support for not touching their eyes, nose and mouth (28.1%) indicates that attitudes may be linked to how realistic the request is perceived to be.

Measure	Extremely Frequency (%)	Moderately Frequency (%)	Slightly Frequency (%)	Not at all Frequency (%)
Avoiding contact with others if told to self-isolate	340 (79.6)	66 (15.5)	16 (3.7)	5 (1.2)
Vaccinations	323 (75.6)	73 (17.1)	22 (5.2)	9 (2.1)
Using disinfectant hand gel regularly	220 (51.5)	165 (38.6)	35 (8.2)	7 (1.6)
Social distancing	216 (50.6)	162 (37.9)	46 (10.8)	3 (0.7)
Wearing a face mask	215 (50.4)	169 (39.6)	34 (8.0)	9 (2.1)
Reducing frequency of leaving home	206 (48.2)	147 (34.4)	60 (14.1)	14 (3.3)
Washing hands with soap for up to 20s	200 (46.8)	180 (42.2)	43 (10.1)	4 (0.9)
Covid-19 asymptomatic tests	189 (44.3)	166 (38.9)	60 (14.1)	12 (2.8)
Bars and restaurants being closed	179 (41.9)	162 (37.9)	65 (15.2)	21 (4.9)
Avoiding commonly touched surfaces (e.g. doorknobs)	164 (37.4)	190 (44.5)	64 (15)	9 (2.1)
Disinfecting surfaces around the home	135 (31.6)	189 (44.3)	84 (19.7)	19 (4.4)
Gym closures	134 (31.4)	172 (40.3)	86 (20.1)	35 (8.2)
Restrictions on group sporting activities	125 (29.3)	176 (41.2)	100 (23.4)	26 (6.1)
Avoiding touching nose eyes and mouth	120 (28.1)	202 (47.3)	93 (21.8)	12 (2.8)
Non-essential shops being closed	109 (25.5)	193 (45.2)	91 (21.3)	34 (8)
Tier system for national lockdown	54 (12.6)	146 (34.2)	153 (35.8)	74 (17.3)

Table 7: Efficacy of safety measures (n=427)

Generally, support for the efficacy of measures pertaining to the tier system for national lockdown was lowest (12.6%). In particular, the closure of gyms and non-essential shops, as well as restrictions on group sports, were more likely to be perceived as only moderately or slightly effective. Interestingly, being likely to go to a friend's house was positively correlated with favourable attitudes to the tier system. One explanation is that a more favourable attitude towards the system is reflected in a greater awareness of the details of each tier's rules, and thus a greater propensity to see a friend if those rules allow.

Attitudes towards proposed vaccination passports, which would enable access to entertainment venues (e.g. bars, restaurants and other social events), were largely

positive but mixed again (Table 8). Although a majority felt they should be mandatory (57.6%), this was not a view held by all.

Attitude	Frequency (%)
I think it's right that they should be compulsory for everybody's safety	246 (57.6)
I think they should be entirely voluntary	103 (24.1)
I think the whole idea should be abandoned, they're divisive and discriminatory	78 (18.3)

Table 8: Attitudes to local vaccination passports (n=427)

Thoughts on returning to campus

As expected, a number of themes extracted from the responses were provided (Table 9). Ambivalence was the most common, often manifested as a desire to return to normal university social life but also with some Covid-related nervousness. Conversely, the opposite was also found, in that some respondents reported feeling safe regarding Covid-19 and instead expressed a worry about the social aspects of campus life. This appeared to be particularly common among first year students who, for many in this group, had little social interaction this year and so returning to campus would pose the first true social opportunities. Somewhat related to this, many ambivalent students suggested that Covid-19 safety was less of a concern than potential mental health related impacts. There were a considerable number of responses tying a return to campus to an increase in anxiety, either as a function of general social anxiety or, particularly for first years, because they did not know any other students.

Theme	Example
Ambivalence	"Concerned about safety but excited to return."
Fear of Self-Isolation	"Don't want to have [sic] constantly self-isolate due to track and trace."
Indifference	"There's no point, as I've two months left of my final year."
Eagerness	"I can't bloody wait."
Cynicism	"Feels like staff don't want to be there."
Preference for Online Formats	"As someone with anxiety, I prefer the online method as opposed to in-person."
Anxiety	"Terrified as I don't take being ill very well, nor do I enjoy wearing masks."

Table 9: Returning to campus (in order of mention)

On the other hand, many students expressed an eagerness to return to campus. For some, this stemmed from a feeling that they missed out on their first year of university and, most especially, a desire to meet new people and socialise with their friends. For others, a return to campus meant a return to a higher standard of education, evidencing a feeling that online lectures were insufficient or of lower quality. Similar responses highlighted that a return to campus was important for student grades and motivation, or its necessity for those with lab-based assignments. For others still, what was most important was that a return to in-person lectures represented a return to normalcy more generally.

Although a feeling that online or blended learning was inferior to on-campus lectures and seminars was commonplace, some students reported preferring online learning formats. In almost all cases, this corresponded to a reduction in social anxiety which was perceived to hamper academic attainment in regular circumstances. A small number of respondents who were excited about returning to campus also suggested that they would miss online lectures moving forward due to their convenience.

Some responses were complex and highlighted several frustrations with their experience of the pandemic as a student:

> *"To [sic] little too late, the university expects us to work as normal, when we started in lockdown with no access to the required tools, now back at uni I'm not going to restart my work just because my tutors like a certain software, no safety netting, no proper support, most students feel abandoned, £9,000 to stay at home, this year feels like a joke, so does this this survey especially when you award two £25 Amazon vouchers for completing this, was £9,000 a year per student not enough for you, what a joke."*

This extreme cynicism was observed in other responses also, with one respondent feeling that staff would not want to be at university. Others doubted the motivations of returning, suggesting that a safe return was unlikely and instead reflected a need to 'keep [the university's] cash flow constant'. In a similar line of reasoning, the need of returning to campus-based lectures was also questioned, with some respondents contending that most of the year had already elapsed. This latter point reflected a sense of indifference, drawing particular attention to the fact that third years had less than two months left of their final year. A small number of respondents said that it was a waste of time to return for a single week of teaching.

Perceived safety and life returning to normal

Most students expressed a tentative feeling of safety with life returning to normal more generally (Table 10). For many respondents, a sense of safety was contextual, such as on the venue. In other cases, it was under the condition that life returned to normal gradually, rather than abruptly. Many emphasised the role played by people in being sensible, particularly regarding social distancing, mask wearing and taking up vaccines when appropriate. For some students, it was a combination of several factors:

"Yes. With hand sanitiser and masks in place, I feel safe. In public, people don't social distance very well, so large attractions I probably would not want to attend or feel safe, but bars and restaurants where you have your own seated area feel safe. Shopping depends on how busy it is, as again lots of people do not socially distance so it can feel unsafe when it is busy with lots of people coming quite close to you."

Theme	Example
Tentative	"A bit, but nightclubs would make me uncomfortable."
Insecurity	"I do not feel safe, especially with the initial rush."
Cynicism	"For me, I know it's an illusion of safety with the measures put in place not doing a significant change in infection change, but I have begun to lose my ability to care."
Secure and Excited	"Excited about it."
Indifference	"I don't really [care] and shall continue not to do much socialising. I like my little bubble. "

Table 10: Perceived safety (in order of mention)

This tendency to suspect individuals of not social distancing very effectively appeared to manifest itself in more substantial cynicism for some. A small sample reported believing many people do not care for meeting up with one group of friends, and then another group, and so on with the suspicion for these students being that Covid-19 rates would inevitably rise again due to a lack of adherence to guidelines. Or, as expressed another way: 'too many idiots not following guidelines'. Following from this, some students reported being indifferent and doubting the efficacy of guidelines, calling any sense of safety illusory and having lost the ability to care. This appeared to be tied to a preference for their pre-existing social bubble, a lack of interest in the venues being opened or indifference more broadly to the pandemic.

On the other hand, a considerable number of students not only felt very safe, but also expressed great eagerness for life to return to normal again. Those respondents often emphasised the social aspects of relieving restrictions would facilitate. A common example was nightclubs, being able to have more friends over (at their house) and similar social events. However, a still substantial number continued to express uncertainty or anxiety concerning the easing of restrictions with some preferring a more cautious approach (particular insecurity was levelled at the prospect of an initial rush). Others suggested that even navigating around other people at the time of study was difficult, and worried that social distancing would diminish even further if restrictions were reduced. A small number also argued that they would only feel safe when they were fully vaccinated.

Evaluation of digital resources

Perhaps overall, most students described the video materials aimed at helping students understand Covid-19 and current requirements and guidelines as 'good' but mixed for the extent to which they facilitated a better understanding of their targets (Table 11). Across all three videos, the most frequently reported knowledge source of the video prior to the survey was social media, followed by the Student Union website and Blackboard.

Video Title	Measure	Excellent Frequency (%)	Good Frequency (%)	Satisfactory Frequency (%)	Poor Frequency (%)	n
'How to Prevent the Spread of Covid-19'	Quality of the video	139 (34.4)	220 (54.5)	43 (10.6)	2 (0.5)	404
	Information conveyed	134 (33.1)	225 (55.7)	43 (10.6)	2 (0.5)	404
	Better understanding	64 (15.8)	120 (29.7)	141 (34.9)	79 (19.5)	404
'Get an Asymptomatic Covid Test'	Quality of the video	139 (35.0)	212 (53.4)	43 (10.8)	3 (0.8)	397
	Information conveyed	165 (41.6)	193 (48.6)	37 (9.3)	2 (0.5)	397
How to Keep the Community Safe	Quality of the video	98 (24.9)	218 (55.3)	69 (17.5)	9 (2.2)	394
	Information Conveyed	95 (24.1)	229 (58.1)	66 (16.8)	4 (1.0)	394
	Better understanding	97 (24.6)	105 (26.6)	139 (35.3)	53 (13.5)	394

Table 11: Evaluation of digital resources (number of responses varied as indicated)

Discussion and conclusions

The PER Project (2020-2021) aimed to explore the knowledge, attitudes and behaviours of University of Lincoln students towards Covid-19 to help protect themselves and others and to reduce the risk of the virus spreading within the wider Lincolnshire community. Overall, the findings suggest a largely positive outcome with respondents adhering diligently to most safety measures informed with an adequate to good subject knowledge for the most part and generally willing to 'do their bit' to protect the community when they believed their behaviours to be truly helpful. That said, and in some areas in particular, findings were mixed indication that not all respondents perceived the pandemic equally or considered its effects seriously. Thankfully, these numbered relatively few overall. Continued collaboration between health scientists and officials, especially those spearheading information campaigns, will likely continue to facilitate increasing take-up of safety behaviours.

Though students rated most of the digital resources viewed in the survey as being of good quality, their perceived usefulness was often less well evaluated. Consistent with this, no differences in knowledge or behaviours were observed for students who

had previously seen the videos and those who had not. Penetration of the resources into the student community was admittedly limited – as implied for the relatively few students who had seen them before the survey – and as such, it is difficult to provide any conclusive statements as to their lasting effectiveness.

With the recent rise of social influencers as effective brand ambassadors, one medium which remains unexplored is the use of such networks to communicate Covid-19 information. Although various popular celebrities have used their renown to spread awareness, the more personal relationships which influencers share with their followers may prove to be an especially useful alternative mechanism to explore. One consideration regarding evaluating the extent to which the resources improved understanding is that they largely focused on the standard, basic knowledge and behaviours concerning Covid-19. As evidenced by the initial and present surveys, students are generally and already knowledgeable about these aspects; therefore, the mixed findings in this area may simply reflect that students cannot benefit very well from what they already know.

There are several caveats to be considered from within this project's findings, not least of all the relatively small sample and nature of respondents relative to the overall student community. With most respondents drawn from the College of Science (including medicine), for example, and known in the literature to be more knowledgeable than other students regarding Covid-19, it is plausible that some results were influenced and slightly inflated as a result. Given the rapid pace with which both the pandemic and lockdown regulations have proceeded, there is a risk that the present findings could quickly become outdated. At the time of writing, vaccination was well under-way and it is likely a considerably higher percentage of university students have been vaccinated than indicated. Moreover, lockdown regulations in Lincolnshire have been eased since the survey closure date. Therefore, some caution is advised in generalising and inferring from the more temporally sensitive results. Furthermore, there is also the possibility of social desirability bias, meaning that respondents may be inclined to give a particular answer they feel may elicit social reinforcement, such as safety measure adherence. Although this is often a problem intrinsic to survey-based research, it was limited here by the assurance of anonymity and the fact that the survey was completed over the internet, factors implicated in reduced social desirability. Further, as evidenced in the findings, patterns in behaviour are still identifiable, particularly in how behaviour has changed since before the pandemic.

Although students were once last in line to receive vaccines, an increasing number are being offered immunisation suggesting a burgeoning rationale for investigating how this continues to impact on behaviour. In addition, polarised findings were discovered regarding attitudes towards online education at university. Although many students thought online learning provided a subpar standard of education, others found the shift to e-learning to be highly beneficial. Common themes included the convenience factor and reduced anxiety. Unfortunately, no questions here assessed what the elements were that students felt made online learning so much worse,

however. This is one avenue that may interest future researchers, especially as these may hold insight as to problems to be resolved in higher education teaching more generally.

The present findings suggest student behaviour at the University of Lincoln has shifted considerably since before the pandemic, largely towards conforming to the behavioural recommendations outlined by the university, the government and the NHS. Evidence that stated adherence to specific behaviours are correlated with their perceived efficacy gives impetus to the recommendation that communication of purpose and the empirically supported utility of safety measures is paramount in their uptake. Future resources may wish to target these less frequently communicated elements which students understand less well. Another plausibility is that more traditional, mainstream forms of communication may remain more effective.

Acknowledgements

The authors would like to take this opportunity to thank the Lincolnshire Community Foundation for funding the PER Project, Professor John Sharp for his assistance in guiding the initial reduction and analysis of data and reviewing the article, and Tom Wright, Aaron Good, Martyn Thayne, Hazel Donnelly, Hannah Coleman, Jacqueline Mayer, Shirley Innes and Simon Crookall of the PER Working Group for steering the project to completion.

Bibliography (Covid-19 and students in Higher Education)

Fully annotated versions of the bibliography are also available in IMPact:

> Beech, H. and Cronin, J. (2021) Preventative Emergency Response (PER) Covid-19 Project 2021: Annotated bibliography (revisited). *IMPact Research Notices, 1-5.*
>
> Sharp, J.G. (2021) Covid-19 and the mental health and wellbeing of university students: An annotated bibliography. *IMPact Research Notices, 1-8.*

Abbasi S. (and 3 others) (2020) Perceptions of students regarding E-learning during Covid-19 at a private medical college. *Pakistan Journal of Medical Sciences* [Online: doi.org/10.12669/pjms.36.COVID19-S4.2766].

Adnan, M. and Anwar, K. (2020) Online learning amid the Covid-19 pandemic: Students' perspectives. *Journal of Pedagogical Sociology and Psychology*, 2(1), 45-51.

Asselmann, E. (and 3 others) (2020) The role of personality in the thoughts, feelings, and behaviors of students in Germany during the first weeks of the Covid-19 pandemic. *PLoS ONE*, 15(11), 1-14.

Bono, G., Kresimir, R. and Hescox, J. (2020) Stress and wellbeing in urban college students in the US during the Covid-19 pandemic: Can grit and gratitude help? *International Journal of Wellbeing*, 10(3), 39-57.

Cao, W. (and 6 others) (2020) The psychological impact of the Covid-19 epidemic on college students in China. *Psychiatry Research*, 287, 112934.

Capone, V. (and 3 others) (2020) University student mental well-being during Covid-19 outbreak: What are the relationships between information seeking, perceived risk and personal resources related to the academic context. *Sustainability*, 12, 7039.

Cohen, A.K., Hoyt, L.T. and Dull, B. (2020) A descriptive study of Covid-19 related experiences and perspectives of a national sample of college students in Spring 2020. *Journal of Adolescent Health* [Online: doi.org/10.1016/j.jadohealth.2020. 06.009].

Cox, A. and Brewster, L. (2020) Library support for student mental health and well-being in the UK: Before and during the Covid-19 pandemic. *The Journal of Academic Librarianship*, 46(6), 102256. [Online: doi.org/10.1016/j.acalib.2020.102256].

Ding, Y. (and 7 others) (2020) Risk perception of coronavirus disease (Covid-19) and its related factors among college students in China during quarantine. *PLOS ONE* [Online: doi.org/10.1371/journal.pone.0237626].

Galle, F. (and 11 others) (2020) Understanding knowledge and behaviours related to Covid-19 epidemic in Italian undergraduate students: The EPICO study. *International Journal of Environmental Research and Public Health,* 17, 3481.

Gao, J. (and 8 others) (2020) Mental health problems and social media exposure during Covid-19 outbreak. *Plos One* [Online: doi.org/10.1371/journalpone.0231924].

Gao, Z. (and 5 others) (2020) A cross-sectional study: Comparing the attitude and knowledge of medical and non-medical students towards 2019 novel coronavirus. *Journal of Infection and Public Health* [Online: doi.org/10.1016/j.jiph.2020.06.031].

Hatabu, A. (and 7 others) (2020) Knowledge, attitudes, and practices toward Covid-19 among university students in Japan and associated factors: An online cross-sectional survey. *PLoS ONE*, 15(12), 1-19.

Islam, M.A. (and 4 others) (2020) Depression and anxiety among university students during the Covid-19 pandemic in Bangladesh: A web-based cross-sectional survey. *PLOS ONE* [Online: doi.org/10.1371/journal.pone.0238162].

Joinson, A. (1999). Social desirability, anonymity, and Internet-based questionnaires. *Behaviour Research Methods, Instruments, and Computers*, 31(3), 433-438.

Kecojevic, A. (and 3 others) (2020) The impact of Covid-19 epidemic on mental health of undergraduate students in New Jersey: Cross-sectional study. *Plos One* [Online: doi.org/10.1371/journal.pone.0239696].

Khan, K.S. (and 3 others) (2020) The mental health impact of the Covid-19 Pandemic across different cohorts. *International Journal of Mental Health and Addiction*. [Online: doi.org/10.1007/s11469-020-00367-0].

Khattar, A., Jain, P. R. and Quadri, S. M. K. (2020) Effects of the disastrous pandemic Covid-19 on learning styles, activities and mental health of young Indian students: A machine learning approach. *4th International Conference on Intelligent Computing and Control Systems (ICICCS)*, 1190-1195.

Komer, L. (2020) Covid-19 amongst the pandemic of medical student mental health. *International Journal of Medical Students*, 8(1), 1-2.

Mahdy, M. A. (2020) The impact of Covid-19 pandemic on the academic performance of veterinary medical students. *Frontiers in Veterinary Science* [Online: doi.org/10.3389/fvets.2020.594261].

Majumdar, P., Biswas, A. and Sahu, S. (2020) Covid-19 pandemic and lockdown: cause of sleep disruption, depression, somatic pain and increased screen exposure of office workers and students of India. *Chronobiology International*, 37(8), 1191-1200.

Nambiar, D. (2020) The impact of online learning during Covid-19: Students' and teachers' perspective. *The International Journal of Indian Psychology*, 8(2), 783-793.

Noreen, K. (and 5 others) (2020) Knowledge, attitudes, and practices against the growing threat of Covid-19 among medical students of Pakistan. *PLoS ONE*, 15(12), 1-12.

Olaimat, A.N. (and 4 others) (2020) Attitudes, anxiety and behavioural practices regarding Covid-19 among university students in Jordan: A cross-sectional study. *American Journal of Tropical Medicine and Hygiene*, 103(3), 1177-1183.

Sahu, P. (2020) Closure of universities due to Coronavirus disease 2019 (Covid-19): Impact on education and mental health of students and academic staff. *Cureus*, 12(4), e7541.

Santiago, I. P. (and 3 others) (2021) Emergency remote teaching and students' academic performance in Higher Education during the Covid-19 pandemic: A case study. *Computers in Human Behavior* [Online: doi.org/10.1016/j.chb.2021.106713].

Savage, M.J. (and 6 others) (2020) Mental health and movement behaviour during the Covid-19 pandemic in UK university students: Prospective cohort study. *Mental Health and Physical Activity*, 19, 100357.

Schiff, M. (and 3 others) (2020) Covid-related functional difficulties and concerns among university students during Covid-19 pandemic: A binational perspective. *Journal of Community Health: The Publication for Health Promotion and Disease Prevention* [Online: doi.org/10.1007/s10900-020-00930-9].

Sharp, J., Wright, J., Cotton, C. and Good, A. (2021) PER Project 2020-2021 Initial Report. *IMPact: Journal of Higher Education Research*, 1-7. Available at: Dissertation Title (cpb-eu-w2.wpmucdn.com).

Son, C. (and 4 others) (2020) Effects of Covid-19 on college students' mental health in the United States: Interview survey study. *Journal of Medical Internet Research*, 22(9), e21279.

Tanhan, A. (and 9 others) (2020) A proposed framework based on literature review of online contextual mental health services to enhance wellbeing and address psychopathology during Covid-19. *Electronic Journal of General Medicine*, 17(6), em254.

Zeballos Rivas, D. R., (and 6 others) (2021) Social media exposure, risk perception, preventive behaviors and attitudes during the Covid-19 epidemic in La Paz, Bolivia: A cross sectional study. *PLoS ONE*, 16(1), 1-12.

Zhai, Y. and Du, X. (2020a) Addressing collegiate mental health amid Covid-19 pandemic. *Psychiatry Research*, 288, 113003.

Zhai, Y. and Du, X. (2020b) Mental health care for international Chinese students affected by the Covid-19 outbreak. *The Lancet (Psychiatry)*. [Online: doi.org/10.1016/S2215-0366(20)30089-4].

Zhao, B. (and 5 others) (2020) Novel coronavirus (Covid-19) knowledge, precaution practice and associated depression among university students in Korea, China and Japan. *International Journal of Environmental Research and Public Health*, 17, 6671.

Zolotov, Y. (and 3 others) (2020) Covid-19, fear, mental health and substance use among Israeli university students. *International Journal of Mental Health and Addiction*. [Online: doi.org/10.1007/s11469-020-00351-8].