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Legacy impacts of the pandemic on the recruitment of new participants at parkrun in Scotland

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ABSTRACT

The COVID-19 pandemic reduced physical activity during lockdown and had legacy impacts differentially affecting specific demographics. Key knowledge gaps remain in relation to the legacy impacts on rural communities which can require specific health intervention plans. Active leisure events like parkrun promote community exercise. Participation at parkrun was lower when events resumed after lockdown with disproportionate losses of females and those in deprived areas. It is unclear how the pandemic impacted recruitment at parkrun. This study compared the demographics of new participants at parkrun events in Scotland in the years before and after the pandemic. The study found a significant reduction in new participants, with more populated areas more resilient to losses, suggesting rural communities are engaging in more crowd avoidance post- pandemic. The age of new participants declined post-pandemic and the gender ratio shifted towards males. Prior to the pandemic the finishing time of new participants had been slowing, as parkrun became more inclusive, but the pandemic reversed this trend resulting in disproportionate losses of the least fit. The study also suggests the pandemic could have introduced a new barrier to engaging in physical activity, fear of catching COVID, which disproportionately affected women in rural communities.

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Introduction

Physical activity is associated with many health benefits and reduced mortality risks (Grandes et al., 2023; Lavie et al., 2019). Several frameworks have been developed to explain changes in levels of engagement with physical activity. The most widely adopted framework, social cognitive theory (Bandura, 1998; Egele et al., 2025; Lewis et al., 2002; Rhodes et al., 2019; Zechner & Gill, 2016), is based upon understanding individual motivations to engage in physical activity. These include the perceived benefits from physical activity (Ghayour Baghbani et al., 2023), with self-efficacy a

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key determinant of levels of activity (Ghayour Baghbani et al., 2023; Han et al., 2022; Lewis et al., 2002; Peng et al., 2025; Romeo et al., 2021). Social cognitive theory proposes that individual determinants of activity are influenced by environmental factors which can act both positively, such as social support networks, and negatively, such as a lack of suitable places to engage in exercise (Egele et al., 2025). This framework has been used to help devise successful health interventions and identified the importance of context, for example, through the development of specific interventions for rural communities (Walsh et al., 2017).

The COVID-19 pandemic was an extreme environmental factor that majorly impacted global engagement with physical activity. Lockdowns prevented sporting and active leisure events from taking place, with substantial reductions in levels of physical activity occurring as a result (Castañeda-Babarro et al., 2020; Magutah & Mbuthia, 2022; Makizako et al., 2021; Nosaka et al., 2022; Petersen et al., 2021). The post-pandemic shifts in activity levels have particularly impacted women, younger adults and the least fit widening many existing health inequalities (Bann et al., 2021; Kyan & Takakura, 2022; Wijngaards et al., 2022). Many health interventions designed to promote activity involve social group exercise but studies have shown some people have started to avoid crowded areas (Kim & Kang, 2021) which could impact participation in community events. This new pattern of behaviour is age dependent with older adults more likely to engage in crowd avoidance as a result of a higher perceived risk of catching COVID-19 (Kim & Kang, 2021). Further evidence of crowd avoidance at running events post-lockdown comes from a study of participation at running events in Greece has shown avoidance of participation at larger events, events that are further away from the participant's home and events where the participant would need to use public transport to travel to and from the event (Maditinos et al., 2021). As we move into a post-lockdown world, studies are urgently needed into the longer-term legacy impacts of the pandemic on patterns of participation in physical activity across different groups. Studies are also needed on the impact of the pandemic of existing health interventions designed to encourage higher levels of activity. Another key remaining knowledge gap relates to whether the legacy impact of the pandemic may have differentially affected health interventions in rural compared to urban communities (Walsh et al., 2017).

Active leisure events are a health intervention aimed at increasing levels of physical activity (Hillman et al., 2021). These differ from traditional mass-participation events in that they are primarily aimed at increasing the level of physical activity of those currently engaging in too little (Hillman et al., 2021). One example of a highly successful active leisure event is parkrun who provide around 2,000 free weekly 5 km running events across 22 countries and who have recently organised their one millionth event (Millionth Parkrun, n.d.). Although parkrun is timed there is no requirement to run with many participants including volunteers walking the 5 km routes (Gilburn, 2025a). These events are designed to increase levels of physical activity and promote wellbeing through engagement in green exercise (Mission Statement - Parkrun Volunteers, n.d.; Reece et al., 2019). Several studies have identified physical and mental health benefits from engaging in parkrun both as a participant and a volunteer (Grunseit et al., 2017, 2020; Haake et al., 2022; Hindley, 2022; Khanji et al., 2022; Quirk et al., 2021; Warhurst & Black, 2022; Wiltshire & Stevinson, 2018). Studies have also identified characteristics of individuals and environmental factors that are

associated with engagement at parkrun (Chivunze et al., 2021; Cleland et al., 2019; Petersen et al., 2021; Reece et al., 2022; Stevens et al., 2019). Among these, feeling like part of a community (Bowness et al., 2021a, 2021b; Davis et al., 2021; Hindley, 2020) and the rewards from volunteering (Ashdown-Franks et al., 2023), have both been found to be key social determinants of continued engagement.

The weekly nature of parkrun, its large number of event locations and the fact that the results of all events are published online make it an ideal model system for assessing the impacts of the pandemic on an active leisure event. While parkrun was suspended during the COVID-19 pandemic previous regular parkrun attendees reported lower levels of physical activity (Quirk et al., 2023; Rousham et al., 2024). When parkrun resumed, reductions in attendance at parkrun events were reported in England and Wales (Rousham et al., 2024). In Scotland, not only were attendances down, there were also disproportionate losses of young participants, women, the less fit and those in more deprived areas (Gilburn, 2023a). What is unclear is what the lasting impacts of the pandemic are on engagement with active leisure events. Events such as parkrun can only grow through recruiting new participants. If potential new participants have become risk averse to engaging in social activity, particularly in larger groups, then the pandemic could have a major legacy impact on active leisure events through the creation of a new barrier to engagement with social exercise, the fear of catching COVID-19. Another key question is whether any legacy impacts identified vary with the density of population surrounding an event. This is important as rural communities can require different health interventions to urban communities (Walsh et al., 2017) and urban communities could have more crowded parkrun events.

This study uses Scotland as a model system. Scotland has a wide range of different parkrun locations from large urban events in city centre parks to the most isolated rural events present in the UK. Previous studies of parkrun in Scotland have revealed that prior to the pandemic there was a narrowing gender gap towards female participants and that the finishing times of new participants had been getting slower suggesting it was becoming more inclusive (Gilburn, 2023b). A study of the characteristics of new participants found higher return rates for men, older participants, faster participants and participants attending smaller events. In addition events with a higher proportion of other first time participants and events with higher proportions of woodland and freshwater along their routes had higher return rates (Gilburn, 2023c, 2025b).

The broad aim of this study was to determine the legacy impacts of the pandemic on engagement with a mass participation event by comparing the numbers and characteristics of new participants at parkrun events in Scotland before and after the pandemic. Specific knowledge gaps to be addressed include: (1) what impact the pandemic has had on recruitment of new participants to parkrun in relation to the population density surrounding an event and; (2) what impact it has had on existing health inequalities by determining its relative impact on the number of new participants from key underrepresented groups.

Materials and methods

This was an analytical study of aggregated secondary data and as such there were no active participants. The secondary datasets are all publicly available. Three different

datasets were established: an events dataset, a new participants dataset and an all participants dataset. These all covered the same two separate year-long periods either side of the pandemic. These periods were: pre-pandemic - February 2019 until January 2020; post-pandemic - 14th August 2021 when parkrun restarted on the Scottish mainland until 13th August 2022. Events did occur in February and March 2020 but the pandemic was headline news by then and this could have already started to impact behaviour, hence this period was excluded.

Event dataset: Each parkrun event location has a published event history (University of Stirling Parkrun, n.d.). The following factors were extracted from the event histories: number of attendees, the date, the event number and the location of each event. Events are numbered chronologically at each parkrun location so events with higher event numbers are occurring at longer established parkruns. The mean attendance was calculated across the time period for each event.

Participant datasets: The parkrun results for all events that occurred over the period were processed using an Excel macro which extracted the gender (this is selected by the participant), age category and finishing time for all participants (Parkrun Statsgeek Group, n.d.). Age is provided as a 5-year cohort except for 18 to 19-year-olds where it is a two-year cohort. Age was converted to a continuous variable by assigning participants the mid-point for their cohort group. New participants to parkrun were identified in the results. The proportion of new participants was determined for each event for inclusion in the events dataset.

Non-parkrun datasets: Two additional secondary datasets were used. The Scottish Index of Multiple Deprivation (SIMD) 2020 was determined for the data zone within which each parkrun is located (Scottish Index of Multiple Deprivation, n.d.). For SIMD 2020 Scotland was separated into 6,976 data zones which are ranked from the most deprived to the least deprived based upon income, employment, education, health, access to services, crime and housing. The population surrounding each parkrun was determined from the total population within a 10 km radius of the start location of each event (Population Around A Point, n.d.). A 10 km radius was used to distinguish between events in villages and small towns that are close to quite densely populated urban areas from those that are more isolated.

Data analysis

The data were analysed using R x64 4.5.1 (The R Foundation, n.d.).

Events dataset. A generalised linear mixed model (GLMM) was used to identify factors associated with the proportion of new participants at events using the lme4 function (Bates et al., 2015). The proportion of new participants was transformed using the logit function in the car package to generate a normal distribution. Event location was included in the model as a random effect. Continuous predictor variables (mean event attendance, event number, date, population within a 10 km radius of the event and SIMD ranking) were normalised to have a mean of zero and a standard deviation of one using the scale function. The pandemic was included as a binary variable: 0 for pre-pandemic (February 2019-January 2020) and 1 for post-pandemic (14 August 2021–13 August 2022). Minimum Akaike Information Criterion was used to select the optimal model with interaction terms were included for variables retained

in the initial model. Some predictor variables were correlated, therefore variance inflation factors were calculated using the vif function from the car package. No pairs of covariates were maintained in the model if a variance inflation factor of greater than three was identified.

Participants datasets. The same analytical framework was applied to both the new participant and all participant datasets. GLMMs were generated for gender, age and finishing time of participants. Event location was used as random effect in all models. These models only included the pandemic and the population within a 10 km radius of the event, plus an interaction term between the two. A binomial error distribution was used for the model of gender (female = 0, male = 1).

Results

What impact did the pandemic have on the number of new parkrun participants in Scotland

A GLMM of the number of new participants at parkrun events for the year before and after the pandemic revealed that it is strongly correlated with the size of an event, with larger events having proportionately more new participants (Table 1). Date and year before/after the pandemic were inevitably highly correlated. Date produced a weaker fit to the model than the pandemic and so was excluded due to high variance inflation factors. The number of new participants was negatively associated with the number of an event, meaning that longer established events had proportionately fewer new participants. The proportion of new participants was highly significantly lower after the pandemic (Table 1). The proportion of new participants was negatively associated with the population surrounding an event (Table 1). There was a highly significant interaction term between the population surrounding an event and the pandemic (Table 1). For example, after the pandemic the proportion of new participants dropped by 26.2% at parkruns with less than 20,000 people within a 10 km radius compared to a 14% decline at parkruns with more than 20,000 people within a 10 km radius (Table 2). The level of deprivation in the area surrounding the event was not associated with the proportion of new participants. However, there was a weak significant interaction between the pandemic and SIMD with the proportion of new participants dropping slightly more in the most deprived areas of Scotland (Table 1).

Table 1. A generalised linear mixed model of the proportion of new participants at Scottish parkrun events the year before and after lockdown.

Parameter	Estimate	SE	*p*-value
Intercept	−2.636	0.025	<0.001
Mean attendance	0.147	0.031	<0.001
Population within 10 km of event	−0.078	0.028	0.008
Post-pandemic	−0.061	0.008	<0.001
Event number	−0.221	0.026	<0.001
SIMD	−0.094	0.026	0.278
Population * post-pandemic	0.053	0.007	<0.001
SIMD * post-pandemic	0.020	0.007	0.005

Event was included as a random effect. All continuous explanatory variables were scaled. The proportion of new participants was transformed using the logit function. 5402 events were included across 65 different parkrun locations.

What impact did the pandemic have on the gender ratio, age and finishing time of all and new participants?

The gender ratio of all parkrun participants was biased towards males, whereas the gender ratio of new participants was biased towards females (Table 3). The pandemic resulted in a shift towards males in both populations with a larger shift seen among new participants (Table 3).

New parkrun participants were considerably younger than other parkrun participants (Table 3). There was a difference in how these two populations responded to the pandemic with parkrun participants overall becoming considerably older after the pandemic, whereas the mean age of new participants actually got younger (Table 3).

The finishing time of new participants was a lot slower than the average finishing time at events (Table 3). Finishing times overall were not significantly different in the year before and after the pandemic. By contrast, the finishing times of new participants were 52 seconds faster after the pandemic (Table 3).

Did the pandemic differentially impact the demographics of parkrun participants with respect to the population surrounding an event?

There were several significant associations between the population surrounding an event and the demographics and finishing times of new and returning participants (Table 4). There was a positive association between the proportion of male participants and the population surrounding an event (Table 4). There was a negative association between the age of participants and the population surrounding an event (Table 4). There was also a negative association between the finishing time and the population surrounding an event (Table 4).

Table 2. The proportion of new participants at events one year before the pandemic and one year after the parkrun resumed post-lockdown for parkrun locations with more and less than 20,000 people within a 10 km radius of the event.

Population within 10 km	Proportion of new participants before the pandemic (s.e.)	Proportion of new participants post-pandemic (s.e.)	Percentage loss of new participants
<20,000	0.0632 (0.0022)	0.0467 (0.0015)	26.2%
>20,000	0.0467 (0.0007)	0.0401 (0.0006)	14.0%

Table 3. Generalised linear mixed models of the gender ratio, age and finishing times of new and all participants at Scottish parkrun events the year before and after lockdown.

Dependent variable	Participants	Pre-pandemic (s.e.)	Post-pandemic (s.e.)	Parameter estimate (s.e.)	*p*
Proportion of male participants	All	0.537 (0.001)	0.559 (0.001)	0.099 (0.005)	<0.001
Mean age	All	44.85 (0.02)	46.50 (0.02)	1.642 (0.032)	<0.001
Mean finishing time	All	28:56 (00:01)	29:06 (00:01)	0.005 (0.012)	0.711
Proportion of male participants	New	0.432 (0.003)	0.477 (0.004)	0.181 (0.022)	<0.001
Age	New	39.50 (0.09)	39.16 (0.10)	−0.427 (0.136)	0.002
Mean finishing time	New	33:00 (00:03)	32:08 (00:04)	−0.686 (0.063)	<0.001

Event was included as a random effect in all models. 35,059 new participants and 643,797 participants were included across 65 different parkrun locations.

Table 4. Generalised linear mixed models of the gender ratio, age and finishing times of new participants and all participants at Scottish parkrun.

Dependent variable	Participants	Population <20,000	Population >20,000	Parameter estimate (s.e.)	*p*
Gender Ratio	All	0.496 (0.002)	0.554 (0.001)	0.091 (0.018)	<0.001
Age	All	46.99 (0.05)	45.45 (0.02)	−1.150 (0.203)	<0.001
Finishing Time	All	30:32 (00:02)	28:48 (00:01)	−0.574 (0.094)	<0.001
Gender Ratio	New	0.42 (0.007)	0.456 (0.003)	0.067 (0.022)	0.003
Age	New	42.50 (0.17)	38.78 (0.07)	−1.928 (0.270)	<0.001
Finishing Time	New	34.30 (00:08)	32:17 (00:03)	−0.781 (0.158)	<0.001

The population within a 10 km radius was scaled and event location was included as a random effect in all models. 35,059 new participants and 643,797 participants were included across 65 different parkrun locations.

The inclusion of the pandemic and an interaction term between the pandemic and the population surrounding an event identified that the gender ratio of participants became more male biased at events with smaller surrounding populations (β = −0.017, s.e. = 0.005, $p = 0.001$). For example, the proportion of male participants increased by 8.2% (0.515 after; 0.476 before) at events with a surrounding population of less than 20,000 within 10kms, compared to 3.7% (0.565 after; 0.545 before) at events with a surrounding population of great than 20,000 within 10kms.

The equivalent model of the age of participants showed it increased more after the pandemic at events with smaller surrounding populations (β = −0.318, s.e. = 0.003, $p < 0.001$). For example, the mean age of participants increased by 4.8% (48.08 after; 45.88 before) at events with a surrounding population of less than 20,000 within 10kms, compared to 3.4% (46.28 after; 44.72 before) at events with a surrounding population of great than 20,000 within 10kms.

There were no significant interaction terms between the pandemic and the population surrounding event in the all participant finishing time model or any of the models of new participants.

Discussion

Associations between lockdown and the number of new parkrun participants in Scotland

The pandemic had many behavioural impacts upon people including avoiding more crowded leisure and sporting events once they restarted (Kim & Kang, 2021; Maditinos et al., 2021). The study addressed two key knowledges gaps in relation to the legacy impact of the pandemic on active leisure events after they returned post-lockdown. These were the impact on the proportion of new participants, which are crucial for the long-term survival of events, and whether the legacy impacts of the pandemic varied with the population density surrounding an event. The study revealed that the proportion of new participants at parkrun events in Scotland declined in the year after the pandemic compared to the year before. This suggests that some potential new participations could have been avoiding crowded areas after events resumed, creating a new barrier to engagement with active leisure events, the fear of catching COVID-19. However, the findings of the study are not consistent with a simple avoidance of crowded areas which would predict greater losses of new participants at the

most crowded events. The study in fact found a more nuanced pattern with the proportion of new participants being better maintained at more crowded urban events, with greater losses of new participants occurring at smaller parkruns in more rural areas. It should also be noted that although there were greater declines in new participants at more rural events after the pandemic, these events still had a higher proportion of new participants, so the declines came from a much higher starting point. Previous studies have identified that rural communities can behave differently in relation to engagement with physical activity resulting in the design of rural community specific health interventions (Walsh et al., 2017). One reason why rural events may have seen greater loses of new participants could be associated with individuals in more rural areas being less likely to travel after the pandemic. A study in Arkansas found reduced travelling after lockdown in rural areas particularly by women (Nithila et al., 2025). Another possible contributing factor is that in more dense urban areas people have become more accustomed to and, therefore, more relaxed about, being in crowds since the end of lockdowns. By contrast, individuals in more rural areas might be less accustomed to being in the presence of crowds and, therefore, continue to be more risk averse into the post-lockdown era. Another factor driving the difference could be related to the way the pandemic impacted urban and rural communities. Urban communities were initially the most affected, but as the pandemic spread mortality rates eventually became higher in rural areas with this difference continuing into the post-lockdown era (Anzalone et al., 2025). The more recent experience of higher mortality rates could also have resulted in members of rural communities being more risk-averse to crowds when parkrun events returned after lockdown.

The findings of this study do contrast with the findings of another UK based study which found that populations in rural areas recovered back towards their previous levels of pre-pandemic physical activity more quickly than populations in urban areas (Owen et al., 2022). This was particularly driven by increased levels of walking and cycling in rural areas during lockdown. It is possible that potential new participants in rural areas had already adopted alternative forms of physical exercise.

The study also identified that the proportion of new participants dropped slightly more after the pandemic in areas with higher levels of deprivation. This is consistent with greater reductions in physical activity seen in more deprived areas when the pandemic struck and also slower recoveries towards previous levels of physical activity in more deprived areas (Owen et al., 2022). A greater loss of new participants in more deprived areas is likely to translate into slower growth towards pre-pandemic levels at events in these areas. If these patterns continue in the long-term then additional measures might be required to address levels of physical activity in more deprived areas.

Associations between lockdown and the gender of new parkrun participants in Scotland

The gender gap in parkrun participants has been narrowing in Scotland prior to the pandemic, however, after lockdown there has been a substantial shift in the gender of participants back towards males. This effect was greater for new participants. This suggests that women, who were more likely to have reduced their physical activity levels during lockdown (Bann et al., 2021; Kyan & Takakura, 2022; Wijngaards et al.,

2022) are also more likely to have continued to be inactive post-lockdown. This could be related to women displaying disproportionately higher levels of risk averse behaviour in relation to contracting COVID-19 (Barber & Kim, 2021; Long & Liu, 2021). Despite the reduction in females, there are though still more new female than male participants. However, as the likelihood of returning to parkrun is strongly associated with gender, with males more likely to return (Gilburn, 2023c), the overall impact of the increased loss of new female participants, is predicted to be a widening of the gender gap in participation overall, reversing the trend seen prior to the pandemic when the gender gap was closing (Gilburn, 2023b).

Associations between lockdown and the age of new parkrun participants in Scotland

The study showed that the overall the age of participants increased by 1.65 years after parkrun returned from lockdown. By contrast, the study found that the age of new participants showed a small but significant decrease of about 4 months. New participants were around five years four months younger than the mean age of participants at events prior to the pandemic. This gap widened to about seven years four months after the pandemic. One explanation for these observations is that there has been greater movement in and out of parkrun amongst younger demographics. The level of COVID-19 driven behavioural change has been shown to be higher in younger adults so this finding of greater losses of existing young adult parkrun participants and greater gains of new young adult parkrun participants is consistent with other studies (Barber & Kim, 2021). The comparative lack of behavioural change in older men in response to the pandemic had been considered concerning (Barber & Kim, 2021) but may also have had advantages after the pandemic if they were more likely to have continued with activities that they engaged in prior to the pandemic. It does seem to be the case with parkrun in Scotland that older men were the group most likely to have returned to parkrun.

The impact of the pandemic on the finishing times of new parkrun participants

The finishing time of new and all participants to parkrun had been increasing as parkrun became more inclusive with increasing proportions of less fit participants (Gilburn, 2023b). The present study shows that trend has ceased with no changes in the overall finishing times in the year before and after the pandemic. More concerningly, the trend has substantially reversed within new participants to parkrun, who were on average 52 seconds faster in the year after the pandemic than before. This could partially be a result of some individuals taking up running during the pandemic who would therefore have been fitter when attending their first parkrun. However, unless populations became fitter during lockdown, which seems unlikely as it reduced physical activity overall (Castañeda-Babarro et al., 2020; Magutah & Mbuthia, 2022; Makizako et al., 2021; Nosaka et al., 2022; Petersen et al., 2021), it appears the least fit were less likely to try parkrun in the year after the pandemic than in the year before.

The differential impact of the pandemic on parkrun events in rural and urban areas

Rural communities often report lower levels of physical activity meaning parkrun events located in rural communities could be particularly important health interventions (Walsh et al., 2017). The pandemic increased the association between the size of the population surrounding an event and the mean age of participants, so that rural populations had even older participants on average. Prior to the pandemic rural parkrun events had the highest proportions of females, the slowest average finishing times and the oldest participants. This showed that rural parkrun events were being more successful at attracting some key demographics prior to the pandemic. This was the case for both new and existing participants. The pandemic though had significantly impacted this pattern as rural events exhibited the largest proportional losses of females. This could be explained by another UK study which found that women in rural communities recovered more quickly towards pre-pandemic levels by increasing their amount of walking (Owen et al., 2022). It is possible that women in rural communities have found alternative methods of keeping fit. There are though two findings which counter this being the explanation for the loss of new female participants at rural parkrun events. The first is that this previous study also found greater uptake in walking in older age groups, yet there was an increase in age at parkrun events particularly in rural areas. Furthermore, walking is a pastime that is welcomed at parkrun events so those that have engaged in more walking could do this while participating at parkrun. So, the current study still does raise concerns about the loss of new participants to parkrun in rural communities.

Limitations of the study

The study was not an experiment but used existing secondary dataset to identify significant correlations, therefore the outcomes should be treated with some caution with respect to assigning any cause and effect. It should though be noted that a step-change associated with the pandemic produced a much better fit in the model of the proportion of new participants attending parkrun events than a constant change over time, suggesting the changes were more likely to be associated with the pandemic rather than being a result of a change in behaviour over time unrelated to the pandemic.

As the study was based upon correlations across two time periods there could have been other changes that occurred over the same time period of the pandemic that might have influenced the findings. For example, other active leisure and mass participation sporting events were also affected by the pandemic. In Scotland these events tended to return on a similar timescale to parkrun so this might not have affected parkrun attendance, although it is possible that those who regularly attended more competitive events before parkrun had felt starved of any running events during the pandemic and therefore were engaging in more events including parkrun which could have made overall finishing times faster. The proportion of males at competitive running events also tends to be higher and this could similarly have biased the gender ratio towards males. The counter argument to this

is that the changes in parkrun attendance do seem to be a result of losses rather than gains.

Summary

This study has identified a legacy impact of the pandemic on an active leisure event that has extended beyond the lifting of restrictions during lockdown. After parkrun returned attendances were down, particularly for new participants. There was a decrease in the proportion of female and less fit new participants showing the legacy impact of the pandemic seems to be worsening health inequalities. The study also shows that these effects were also influenced by the population density surrounding an event with greater losses of new participants, and particularly female new participants, in more rural areas. It appears the pandemic might have created a new barrier to participation in active leisure events that has extended into the post-pandemic era and which particularly impacts rural communities, women and the least fit. The explanation could be a result of risk averse behaviour causing the avoidance of community physical activity for fear of catching COVID-19 being seen in these demographics. It is important to follow participation levels in these demographics as we move further into the post-pandemic era to determine whether this legacy impact begins to wane and these key demographics start to engage with parkrun at pre-pandemic levels. If this does not happen then additional interventions might be required to promote physical activity within these demographics.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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