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'Pilot' spectator events in British horseracing during COVID-19: post-event SMS COVID-19 reporting

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Abstract

This study aimed to assess: i) COVID-19 transmission prior to and following spectator events, and ii) methodological approaches to capturing event-related transmission during the spectator return. Local authority population transmission rates were used to identify higher transmission areas, which were excluded from participant attendance following registration. Using observational online and SMS questionnaires, self-reported COVID-19 diagnoses (positive tests) and racing-related NHS Test and Trace contacts within 14 days of spectating were reported for two British Horseracing events and three Point to Point (PTP) grassroots races. There were 1,477 registrations for the British Horseracing events, and 1,678 registrations for PTP races. Responses were received from 464 attendees of British Horseracing events (31.4% response rate). Two attendees reported a COVID-19 diagnosis, and no attendees reported NHS Test and Trace contact. From PTP races, 862 attendees (51.3%) consented to receive the SMS survey, and responses were received from 495 attendees (57.4% response rate). Five attendees reported positive COVID-19 diagnoses, and two attendees reported being contacted by NHS Test and Trace, of which one was following a non-racing potential COVID-19 exposure. There was limited evidence of COVID-19 transmission at outdoor elite and grassroots level horseracing events during Autumn 2020. A higher response rate was received with SMS surveys, however there was a reluctance to 'opt in' to SMS methodology. This study describes different methodological approaches to monitoring COVID-19 transmission risk at events, which may have relevance for other sporting and event contexts during the

current pandemic, and sustained attendances during periods with circulating transmissible diseases.

Word Count: 250

Key words: COVID-19; SMS; Survey; Epidemiology; Events; Communicable diseases

Introduction

The COVID-19 pandemic has affected daily life globally and led to unprecedented restriction of activities of daily living and movement for many populations. The sports industry is one of many affected by restrictions, where coordinated group training and competition was wholly prohibited. As COVID-19 case numbers started to decrease in the United Kingdom and in Europe during Summer 2020, there was a phased resumption of previously prohibited and restricted activities. From 13th May 2020, UK government guidelines provided a framework to support the return of elite and recreational sport, through a phased return.¹ For elite sport, these guidelines at that time were from 'Stage 1 - Return to training', through to 'Stage 5 - Safe return of spectators'. These documents provided guidance for clubs, training venues and sports bodies who were navigating managing their athletes and support staff, and eventually progressing towards spectator attendance at competitions.^{2,3} The involvement of Chief Medical Officers informing and collaboration on the development of these guidelines in sport has been described.⁴

From 1st June 2020, horseracing fixtures resumed in England, using a 'behind closed doors' model, effectively resuming the sport from 'Stage 3 – Return to domestic competition',⁵ with defined risk mitigation processes.⁶ The resumption in England was shortly followed by Wales (15th June 2020), and Scotland (22nd June 2020).^{7,8} Sport 'behind closed doors' involves fixtures with limited attendance and enhanced registration, thereby establishing a known number and role for all individuals expected on site. This can facilitate the identification of higher footfall areas (i.e., those frequented by many

attendees or staff groups, such as between changing rooms and parade rings), and the implementation of processes such as one-way systems, staggered arrival times and social distancing in areas where more staff may be present throughout an event. With known numbers for staffing and attendee groups (i.e., race officials, yard staff, jockeys, medical staff), each group can have an assessed level of transmission mitigation, based on their usual (non-COVID-19) race day behaviours, to specifically reduce risks associated with their activities. Additionally, in elite horseracing, 'zoning' of event spaces was introduced, permitting groups of essential staff, or attendee groups to only be permitted in one geographical area of the site, according to their role and with role-specific mitigations. Furthermore, targeted measures can be endorsed and communicated directly to those groups, as was mandated in racing through a COVID-19 education module for all individuals on site, prior to entry.⁶

The Department for Digital, Culture, Media & Sport (DCMS) coordinated a series of pilot events in England during the summer of 2020 to support a coordinated, safe return of spectators, including sports such as cricket, rugby union, horseracing, and soccer. The NHS COVID-19 app was launched in September 2020 to support contact tracing efforts, requiring close contacts to isolate, and consequently reducing SARS-CoV-2 transmission.⁹ Given the prolonged suspension of spectators, and the substantial revenue which they contribute to the sporting sector, several sport governing bodies described the extreme expected financial impact resulting from the absence of spectatorship.^{10,11} However, these statements additionally highlight an understanding of, and commitment to, monitoring and mitigating transmission risk for employees, spectators and local populations around venues, whilst acknowledging the economic consequences of delaying spectator return to elite sport.

To return to a model of spectatorship and larger events, multiple stakeholder involvement is required. Collaboration and dialogue with both national and local partners, including local authorities (a structure of local government, with responsibilities for the local population),¹² is needed to support events with adequate strategic planning and risk mitigation measures, given local data and nuances, such as individual venue geography, travel routes to venues, arrival and departure from venues, and current population

disease rates. Additionally, there are limited data formally describing attendee travel and the movement of individuals for events, which may contribute to related COVID-19 transmission.

The aim of this study was to work with racecourses participating in DCMS pilot events during Autumn 2020, in collaboration with the British Horseracing Authority and Racecourse Managers, to assess COVID-19 transmission prior to and following events, develop a process which limited transmission risk in and around events, and examine methodological approaches to capture event-related transmission following events.

Specific objectives were:

- i) To identify attendees from high COVID-19 case local authorities
- ii) For remaining (permitted) attendees, describe the county of origin for attendees to events
- iii) Assess the number of self-reported COVID-19 cases reported by spectators and all individuals on site at events, in the 14 days after attending an event
- iv) Assess the number of reported NHS Test and Trace contact tracing notifications (COVID-19 app) received by attendees in the 14 days post events.

A secondary aim was to work with the Point to Point ('PTP') Authority, which leads administration, promotion and the development of PTP racing in Great Britain, to achieve the same objectives in a well-attended grassroots sporting context, in a more open (non-stadium) and not traditionally ticketed environment.

Materials and methods

This process was undertaken in British Horseracing and PTP races during Autumn 2020. Institutional ethical approval was received from the University of Bath Research Ethics Committee (REACH EP 19/20 078). Abbreviated informed consent was received through the online health questionnaire (British Horseracing events), or response to the SMS survey (PTP races), after an opportunity to ask questions, and with the information sheet hosted on the gatekeepers' websites.

Patient and Public Involvement

No patients/the public were involved in the design of this study. The study and event advisory groups did have a multi-disciplinary research team, including industry stakeholders from specific racecourses, local public health and council departments.

Event Planning

British Horseracing Events

For each spectator event, a multi-stakeholder approach was taken to promote an inclusive and coherent public health-driven strategy to returning to spectatorship. An event-specific Safety Advisory Group (SAG) was formed, involving Racecourse personnel, the Racecourse owning company, Health and Safety staff, British Horseracing Authority staff, local Fire Protection service staff, local Trading Standards, local police tactical planning staff, local Council Officials, local authority Public Health Personnel, local authority Environmental Health, alongside Academic partners.

The SAG met prior to each scheduled event, to discuss health and safety and the planned race day processes including parking facilities, zoning of the racecourse, capacity, ticketing processes, attendee flow throughout the racecourse, transmission mitigation actions planned, event day staffing, catering and stewarding. The broader racing risk mitigation process undertaken through the COVID-19 Surveillance in Racing programme was presented,⁶ and data showing each racecourse lower tier local authority area (LTLA) in comparison with those nationally was presented. Local Public Health intelligence on the local incidence patterns of COVID-19 was discussed, and trigger points identified to establish acceptable race conditions to proceed with events.

PTP Races

During October and November 2020, several races were scheduled. Protocols were developed and agreed including risk mitigation requirements, and extensions relative to the level of national and regional risk throughout the season. A registration process was introduced, to identify the planned number of attendees, including trainers, riders and owners, and enable post-event contact tracing and communication.

British Horseracing Event Methodology

Condition 1: Spectator Identification

A condition proposed for DCMS British horseracing events by local public health authorities was to identify and restrict attendance from high COVID-19 incidence areas regionally. All attendees (irrespective of study participation) were required to provide a postcode on registration to racecourse administrative staff. Racecourse administration worked with academic partners and local public health officials to identify current (at registration, and prior to race) high incidence ('red') districts based on data from Public Health England's Secondary Generation Surveillance System.¹³ A list of local authority areas with higher COVID-19 incidences was produced, and the government local council finder,¹⁴ and National Statistics Postcode Lookup UK used to identify registered attendees from these regions.¹⁵ Attendees from higher incidence areas and areas under regional restriction (former 'Tier 3' locations) were then informed by racecourse administration that they were unable to attend the event.

Condition 2: Health Questionnaire

A cross-sectional health questionnaire (Appendix 1) was administered 14-days post-event. Two British Horseracing events were included: Day 1 of the St Leger Festival (Doncaster Racecourse, 9th September 2020) and at Warwick Racecourse (21st September 2020). The questionnaire was developed in collaboration with the British Horseracing Authority, to assess any diagnoses of COVID-19 following an event, and any NHS Test and Trace contact (i.e., potential exposure to an individual recently diagnosed with COVID-19) following an event. All individuals present on a race day including event

staff, racecourse staff, jockeys, owners, spectators who were 18 years or older, were eligible to participate.

All attendees who had registered for tickets and event staff mailing lists were sent an email by the Racecourse Manager (acting as a gatekeeper) 14-days later and asked to participate in the online questionnaire. Survey information and a link to consent and participate was distributed in this email, and a reminder was sent after 3 days. Data were collected using Jisc Online Surveys and extracted 21 days post-event. At the time of the events, the 7-day rolling case rate for Doncaster was 18.3 cases per 100,000 population, and for Warwick was 27.1 cases per 100,000 population.

PTP Race Methodology

A cross-sectional questionnaire was also implemented following the three PTP races (Appendix 2). Previous studies have successfully used Short Messaging Service (SMS, 'text') reporting in health and injury settings and found good engagement and response rates.¹⁶ Given the grassroots nature of PTP racing, an SMS survey was implemented. The races were: East Devon (24th September 2020), Kimblewick at Kimble (25th September 2020), and the Ledbury fixture at Maisemore Park (1st November 2020). At the time of the East Devon race, the 7-day rolling new COVID-19 case rate was 82.7 cases per 100,000 population, and under Alert Level 1. For Kimblewick, the 7-day new case rate was 106.8 cases per 100,000 population, and under Alert Level 1. For the Maisemore Park fixture, the 7-day new case rate was 82.1 cases per 100,000 population, and also Alert Level 1.¹⁷

During registration, all attendees were asked to consent to being contacted by the University of Bath regarding their post-race health. The study's information sheet was hosted on the PTP website, and communications around races highlighted the study. Within 24 hours of the 14th day post-race, the SMS questionnaire was distributed through TextAnywhere.¹⁸ If an individual had attended races on both October 24th and 25th, the first message of the survey for October 25th allowed the use of results from the day

previously, if their COVID-19 status remained unchanged. The final question of the survey requested permission to link to an individual's registration data.

Variables, bias and study size

Main outcome measures were a self-reported COVID-19 diagnosis (positive test) within 14 days of attendance, or an NHS Test and Trace contact within 14 days of attendance associated with event attendance. The exposure under investigation was attendance at one of the two British Horseracing events, or three PTP races. If a COVID-19 diagnosis was indicated, participants were asked to state their test date, to decrease the likelihood of misreporting a diagnosis and to facilitate an awareness of whether the exposure was following or prior to events.

Statistical Analysis

Statistical analyses were undertaken in Stata 16.1 and R Studio 1.3.1073. Descriptive statistics (number (percentage) for categorical variables) are presented for each event. R Studio was used to map (ggplot2) attendee counties for all registered and consenting attendees as derived from postcode data at registration, to visualise the home location of attendees. Questionnaire responses were binary or in date format, and all analyses were descriptive. The proportion of consenting questionnaire respondents reporting COVID-19 diagnoses and NHS Test and Trace contact was established, and missing data are reported for each outcome variable.

Results

British Horseracing Events

Event Attendance

There were 1442 attendees at St Leger Day 1, of which 1096 were spectators (76.0%), 11 were racecourse officials (0.8%), 328 were event staff (22.7%) and 7 were local council representatives (0.5%). For Warwick, there were 381 attendees, of which 123 were owners (32.3%), 115 were spectating racecourse members (30.2%), 62 were catering staff, 41 were hospitality guests, and 40 'Amber Zone' attendees, comprising of event staff and committee members.

Local Authority Identification

Home postcodes for the purpose of research were provided by 267 attendees of the St Leger event. Of these, 118 provided Doncaster home postcodes (44.2%), which were local to the event (Figure 1). Home postcodes for the purpose of research were provided by 189 Warwick attendees, of which 63 (33.3%) were Coventry postcode area attendees (Figure 2).

Health Survey

Survey responses were received from 275 St Leger attendees (19.1% response rate), and 189 Warwick attendees (49.6%). Of the 275 attendees, 269 (98.5%) did not have a diagnosis in the 14 days following attendance. Two attendees reported a diagnosis (0.73%), and 2 reported not knowing if they had a diagnosis (0.73%). Of the 189 attendees at Warwick providing data for COVID-19 diagnoses, 189 (100%) reported having no COVID-19 diagnosis.

For St Leger, 270 (98.9%) had not received any contact tracing communications since attending events, with the remaining 3 participants missing data regarding any contact tracing (1.1%). For Warwick attendees, 188 (99.5%) reported no NHS Test and Trace contact since attending the event, and 1 participant (0.5%) had missing data regarding any post-event contact tracing,

PTP Races

Race Attendance

There were 592 ticket registrations for East Devon, 592 for Kimble and 494 for Maisemore Park. Of these planned attendees, 342 (57.8%) provided permission to be contacted for East Devon, 252 (42.6%) for Kimble and 268 (54.3%) for Maisemore Park.

Local Authority Identification

Home postcodes were provided by 278 East Devon attendees, 246 Kimble attendees, and 259 Maisemore Park attendees. For East Devon, 94 attendees reported Exeter home postcodes (33.8%), which were within the same county as the event (Figure 3). For Kimble (Figure 4), 45 attendees were from Oxfordshire (18.3%), a bordering county, and 40 from Hertfordshire and Central Buckinghamshire (16.3%), where the event was held. For Maisemore Park (Figure 5), 50 attendees reported Gloucestershire home postcodes (19.3%), which was the event county, followed by the neighbouring areas of Hereford with 23, and Worcester also with 23 attendees.

Health Survey

Survey responses were received from 208 attendees from East Devon (60.8%), 149 from Kimble (59.1%), and 138 from Maisemore Park (51.5%).

For East Devon, 207 attendees (99.5%) reported no COVID-19 diagnoses following the event, one attendee reported a diagnosis (0.5%). For Kimble, 147 (98.7%) reported no COVID-19 diagnoses, and 2 attendees reported COVID-19 diagnoses (Table 1). For Maisemore, 132 participants reported no diagnoses (95.7%), with 2 missing data and 2 reporting a COVID-19 diagnosis but no test date. Of the negative responses for COVID-19 diagnoses, 21 were attendees who had attended prior events and wished their responses from the previous survey to be used.

In terms of NHS Test & Trace contact tracing notifications within 14 days of attending the races, one attendee at East Devon reported a Test and Trace contact (0.5%), as did one attendee from Maisemore (0.7%), and none from Kimble (Table 1). The positive response from Maisemore reported that this contact was as a result of anon-racing exposure, and no further information was provided by the East Devon respondent.

Discussion

The attendance registrations for British Horseracing events and in PTP races were 3,504 people throughout Autumn 2020. Of those providing home local authority information, the highest proportion of attendees in every event was from either the county itself, or neighbouring counties. There were 7 reported COVID-19 diagnoses from 959 responses across these events (0.07%), with 2 in British Horseracing events (0.04%), and 5 in PTP races. Between the 4th and 10th September, according to the Office for National Statistics estimates, 0.11% of the population had COVID-19, which increased to an estimated 0.21% for the period of the 18th to 24th September.¹⁹ For the period around the PTP races, an estimated 1.13% of the population had COVID-19, which increased to 1.20% for the period to November 6th.¹⁹ Therefore, the rates of COVID-19 observed in our attendees were below those observed in the wider population at these time points.

Having excluded high case areas from attendance as part of the conditions of holding events, COVID-19 prevalence post-event may be expected to be lower in this group than the general population as a whole, due to attendees from high-risk areas being minimised using postcode screening. The thresholds for non-admittance were based on local public health trigger points relative to the national and regional COVID-19 situation at those times. Regional was defined using lower tier local authority (LTLA) and upper tier local authority (UTLA), with UTLAs corresponding to County regions, and UTLAs to District or Borough Council regions. Trigger Point One was defined as red for 40 cases per 100,000 and amber for 13 cases per 100,000 at the UTLA level, and Trigger Point Two of red for 50 cases per 100,000 and amber of 25 cases per 100,000 at the LTLA level.

Racing took a risk-managed approach to its return to sport, and developed protocols including symptom screening of racecourse attendees, developing guidance for managing race days, education initiatives such as a mandatory COVID-19 learning module before admission, and sanctions for any violations of regulations.^{6,20} These initiatives may have supported the few cases reported in this study, and these cases being lower than those observed in the population as a whole. Symptom, temperature and high-risk travel destination screening on entry could have resulted in non-admission, and many risk-mitigation processes were in place on event days, with each racecourse and the PTP Authority responsible for producing written event risk management protocols. The identification and minimisation of crowded areas, managing flow in indoor areas, enhanced cleaning, development of spectator codes of conduct, use of Social Distancing Officers, hand sanitiser availability at prominent locations such as on entry to toilets, near taps or catering areas, implementation of cleaning teams, and movement planning for all groups on site were some of the processes undertaken for each event which may have minimised transmission risks for attendees.

Attendees could have attended multiple events during this time period. With PTP races held on consecutive days and weeks, an accumulation of positive responses over time may have suggested a lack of success or non-compliance with these planned protocols. This was not observed however, and therefore suggests limited transmission, potential protocol compliance, and provides no evidence of transmission at these events.

Limitations worth consideration in the interpretation of these findings includes our response rates which varied between events, with a 19.1% response rate for St Leger, the largest attendance event, and 49.6% for Warwick. PTP response rates were 60.8%, 59.1% and 51.5%, respectively. This higher response rate with SMS survey in a more recreational sporting environment may support the use of SMS in these settings. However, the reduced response rate for each P2P race may also suggest questionnaire fatigue, where attendees had completed this information once, and therefore did not wish to engage further. This may also be evidenced by a higher response to the initial COVID-19 diagnosis, and more missing data regarding NHS Test & Trace contacts. As the study

was undertaken relatively close to the launch of the NHS App, it is also possible that individuals did not actively use this, resulting in missing data.

With lower response rates, particularly for St Leger, we may have unreported cases through lack of questionnaire engagement. This could lead to poor generalisability. Individuals with the health condition of interest are often more inclined to respond to disease-specific health questionnaires, resulting in response bias. This may facilitate the collection of cases (diagnoses or notifications) from our sample, where the identification of cases was the focus of the study. However, in the context of this study this may be less likely to be observed, as there could have been a perceived benefit to participants in not reporting any COVID-19 diagnoses or contact tracing during the return to spectatorship. For this reason, after the initial British Horseracing events with an online questionnaire, SMS methodology was used in PTP races, as it may promote higher engagement, and permits real-time analysis of findings, given rapid participant completion and data extraction.

As diagnoses were self-reported, there is the potential for individuals to misreport COVID-19 diagnoses, particularly for active racegoers who wish to demonstrate that events can be held safely. However, given individual and collective responsibilities for reducing transmission risk, codes of conduct emphasised to attendees, and the sense of shared identity which has been highlighted in spectator behaviour research and may be evident in this form of a psychological crowd,²¹ it is considered that these figures are indicative of this screened, pre-registered and responsive population. Each registration was treated as unique and as a potential attendee. Individuals may have registered for more than one ticket, and if so, their home location used for multiple attendees who may not have attended from the same county. Additionally, not all registered individuals will have attended. Where participants responded 'no from both of us' to SMS messages, these were cross-referenced with multiple ticket holder lists, and the row duplicated to count both responses.

Overall, we found limited evidence of an increased COVID-19 risk in attendees, and lower COVID-19 rates in respondents than in the general population at these timepoints.

Racing is an outdoor sport, and although the substantial planning and operational procedures for risk mitigation when hosting these events should not be underestimated, it does appear to have been successful. It is considered that these findings do not show increased transmission risks following these events and highlight ways in which valuable data on health and COVID-19 transmission risk can be collected. Engaging collaboratively with Local Authorities can support a risk-managed return to sporting events, in nuanced geographical areas and with a local population health awareness. Local public health officers are routinely managing local incidence and transmission data, and alongside Environmental Health Officers provided specialist infection prevention and control advice which was able to be incorporated into event planning and may support sports navigating the coordination and logistics of races during the SaRS-CoV-2 pandemic

Perspective

These findings may not generalise to larger events, those hosted indoors, with catering facilities which are not seated service, or timepoints with higher population rates of COVID-19. Careful planning and logistical considerations such as COVID-19 Assessment Meetings are required, and where possible live data collection of health outcomes may ensure no additional risk is being placed on local authorities, clinical services and the population as a result of any larger spectator events.

Conflicting interests and funding

MD and KS have received project funding for this research as part of the COVID-19 Surveillance in Racing project at the University of Bath, funded by the British Horseracing Association. MD has been a sessional employee of the British Horseracing Association within the last 36 months. MS, AK, PW and AH are employed in racing with their institutional affiliations listed. JH is employed by the British Horseracing Authority as listed.

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Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Figure Legends

Figure 1. Home county for attendees of the DCMS Pilot event at Doncaster Racecourse

Figure 2. Home county for attendees of the DCMS Pilot event at Warwick Racecourse

Figure 3. Home county for Point to Point attendees at the East Devon fixture

Figure 4. Home county for Point to Point attendees at the Kimblewick fixture

Figure 5. Home county for the Point to Point attendees at the Ledbury fixture

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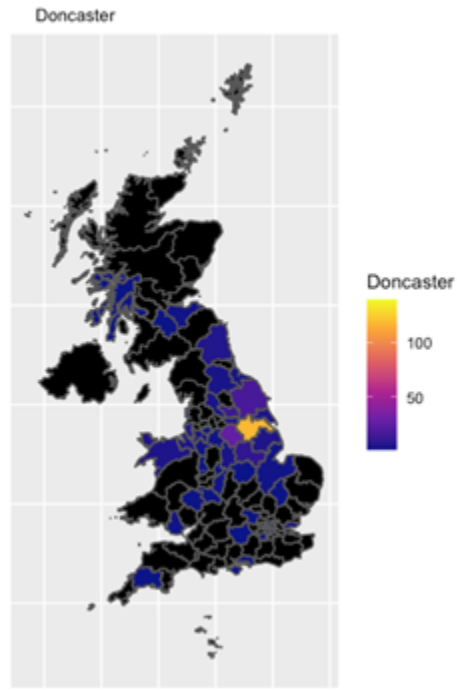
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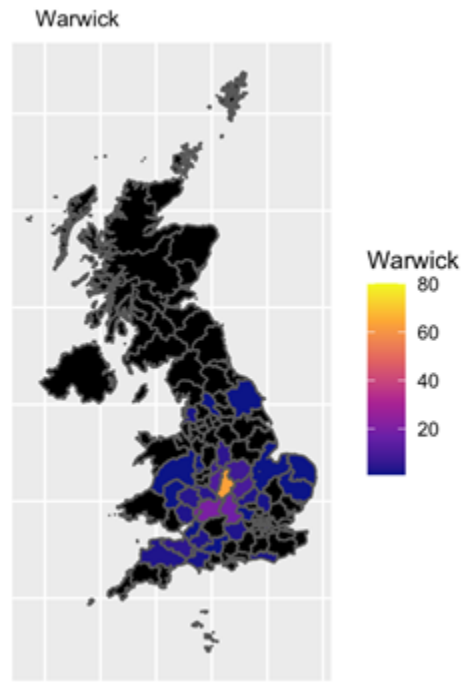
Event	St Leger	Warwick	East Devon	Kimble	Maisemore Park
Attendees	1442	381	592*	592*	494*
Permission for SMS	-	-	342 (57.8%)	252 (42.6%)	268 (54.3%)
Health Survey response	275 (19.1%)	189 (49.6%)	208 (60.8%)	149 (59.1%)	138 (51.5%)
COVID-19 diagnosis					
No diagnosis	269 (98.5%)	189 (100%)	207 (99.5%)	147 (98.7%)	132 (95.7%)
Diagnosis	2 (0.73%)	-	1 (0.05%)	2 (1.3%)	2 (1.4%)
Not known	2 (0.73%)	-	-	-	-
Missing data	-	-	-	-	2 (1.4%)
Did not attend event	-	-	-	-	2 (1.4%)
NHS Test & Trace contact					
No contact	270 (98.9%)	188 (99.5%)	193 (92.8%)	141 (94.6%)	128 (92.8%)
Contact	-	-	1 (0.5%)	-	1 (0.7%)
Not known	-	-	-	-	-
Missing data	3 (1.1%)	1 (0.5%)	14 (6.7%)	8 (5.4%)	8 (5.8%)
Did not attend event	-	-	-	-	1 (0.7%)

Table 1. The number of attendees, responses, COVID-19 diagnoses and NHS Test & Trace contacts for each event and race.

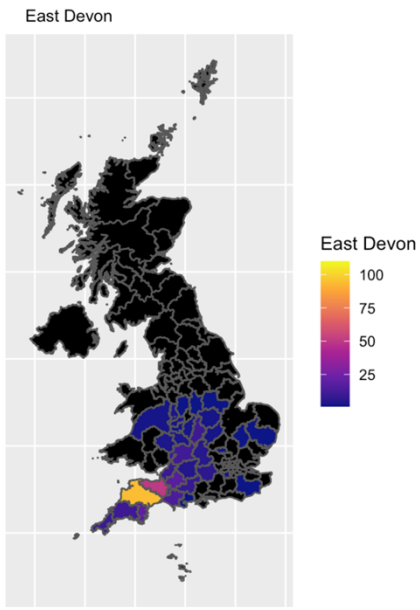
*Ticket registrations, may not reflect attendance



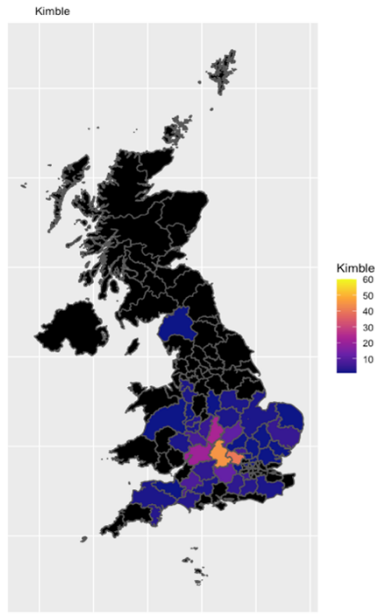
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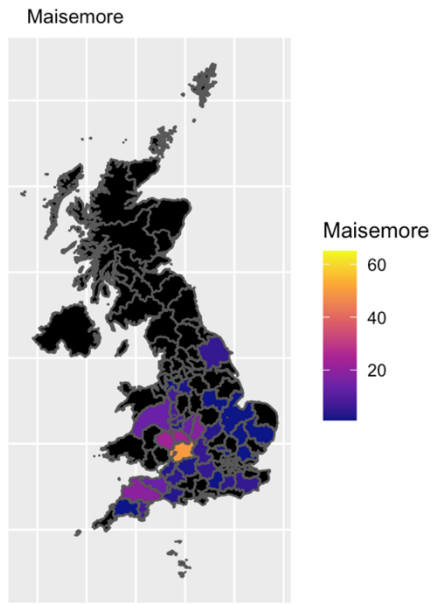
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