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COVID-19: The First 100 Days in the South of Ireland

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Introduction

The COVID-19 pandemic remains unprecedented, by 29/09/2020 over 33 million cases and over 1 million deaths have been recorded worldwide [1]. As a safe and effective vaccine and curative treatment are awaited, current pandemic response remains largely dependent on non-pharmaceutical interventions (NPIs) [2]. In Ireland, exhaustive Public Health efforts and extensive societal engagement with NPIs helped to mitigate risk and to 'flatten the curve' during the initial COVID-19 surge. This facilitated subsequent phased 're-opening' [3]. However, by August 2020 resurgence activity required re-introduction of certain population-level NPIs [3]. The Department of Public Health HSE South covers counties Cork and Kerry (population 690,575) [4]; this is the 2nd largest Public Health region (of 8 nationally). The Health Protection Surveillance Centre (HPSC) provides national oversight for health protection activities. To further inform preparedness for surge activity, we describe the first 100 days of Public Health pandemic activity in our region and suggest 'lessons learned'.

Methodology

We reviewed the epidemiology of confirmed cases of COVID-19 notified to our department from 05/03/2020 - 13/06/2020. In Ireland COVID-19 cases are notified to Public Health under Infectious Diseases Regulations 1981; notifications occurred electronically from laboratories to the national Computerised Infectious Disease Reporting System (CIDR) [5]. Confirmed cases were defined as per HPSC confirmed case definition of 'Detection of SARS-CoV-2 nucleic acid in a clinical specimen' [6]; World Health Organisation (WHO) definition of 'Transmission classification' was used [7]**.** Standardised data were collected locally by Public Health clinical staff during investigation of 'cases' and 'contacts' [8,9]. Contact tracing activities were conducted by trained departmental staff. Support was provided by a novel national contact management programme (incorporating a novel data management system and contact tracing centres). All data are provisional and subject to ongoing review, validation and update; data were extracted from CIDR on 07/07/2020[7]; additional data sources were used for transmission classification. Incomplete data were labelled 'unknown'. MS Excel was used to conduct analysis. This analysis was conducted as part of Public Health usual practice, was not conducted for research, does not include any identifiable information and data were managed in line with data protection requirements, therefore ethical approval was not required.

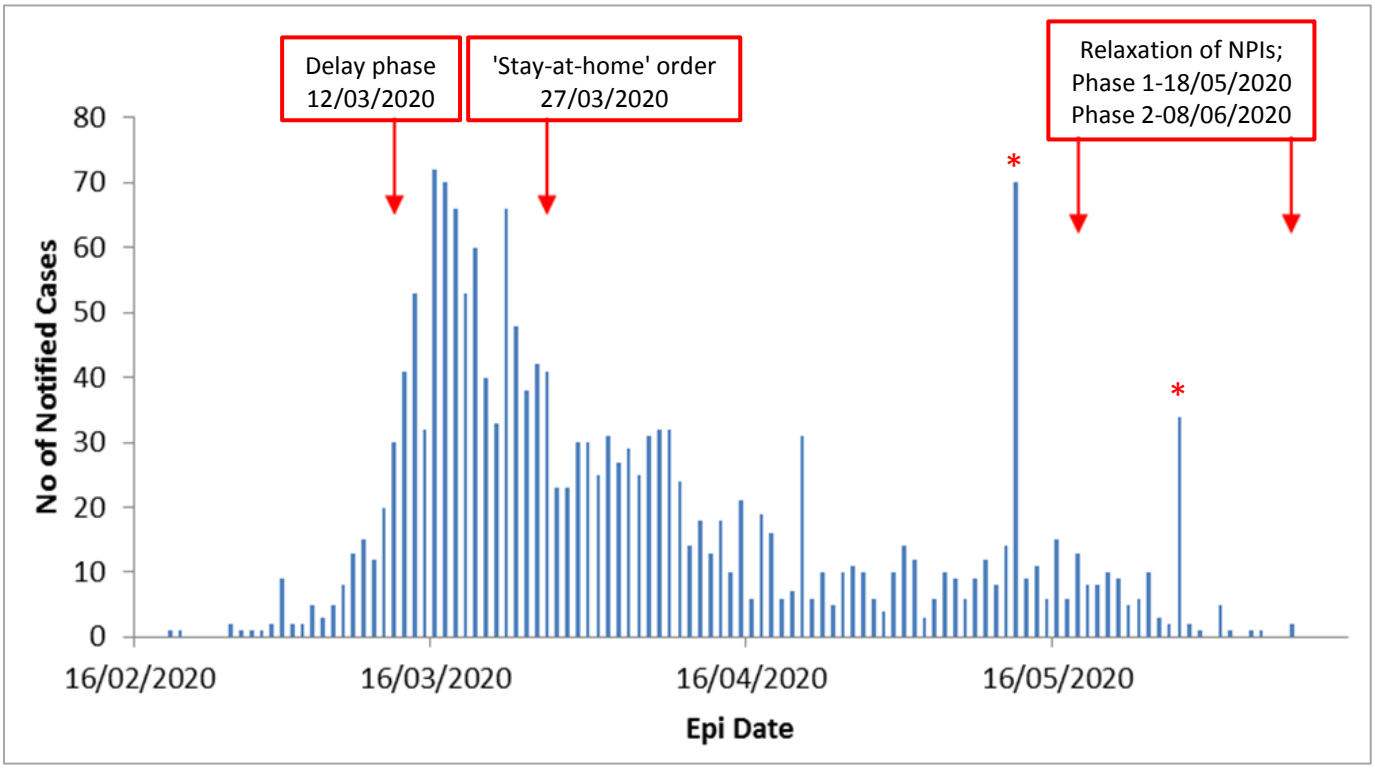
Results

Descriptive epidemiology

The first case of COVID-19 in our region was notified on 05/03/2020; by 13/06/2020 a total of 1,842 confirmed cases had been notified, representing 7.3% of cases nationally for that period [7]. Epidemiological curves (epi-curves) were constructed using 'epidemiological date' (epi-date) and 'notification date' (Figures 1 and 2). These epi-curves are more closely aligned from May 2020 onwards, which likely reflects expedited testing/reporting processes (Figure 2). Of note the HSE South 'epi-date' curve diverges downwards from the national pattern in late-March 2020, which is early in the overall evolution of the pandemic in Ireland (Figure 2).

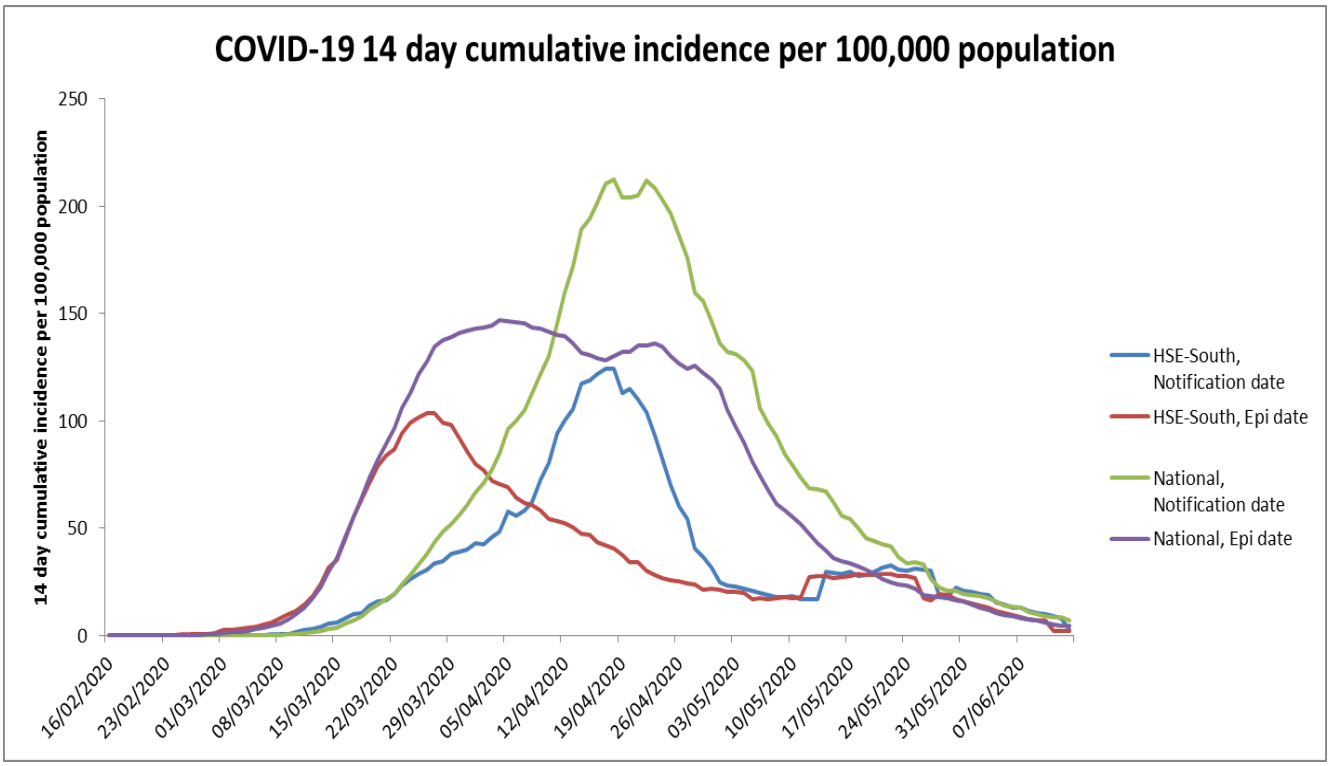
Epidemiological curves

Figure 1. HSE South epidemiological curve by epi-date*



**Epi-date: earliest of onset date, date of diagnosis, laboratory specimen collection date, laboratory received date, laboratory reported date, notification date [7]; * = factory outbreak 'targeted testing' exercise.*

Figure 2. HSE South and National epidemiological curves by epi-date and notification date.



Provisional data extracted from CIDR. Denominator; 2016 census.

Characterisation of cases

Of 1,842 cases, 891 were male (48.4%) and 951 were female (51.6%). Median case age was 47 years. The highest number of cases occurred in age groups >45 years of age. Two-hundred-and-nineteen cases (11.9%) were hospitalised, 33 (1.8%) admitted to ICU and 55 cases (almost 3%) died. The highest rate of hospitalisations per age group occurred in those >65 years (48%, n=106). Of those cases hospitalised, 28 cases (12.8%) died and of those admitted to ICU 9 cases (27.3%) died. Of all cases; 1,346 (73.1%) were symptomatic; 752 (40.8%) had underlying medical conditions, including heart disease 228 (12.4%), respiratory disease 210 (11.4%), diabetes 81 (4.4%); 436 (23.7%) were healthcare workers (HCW); 7 (0.4%) were pregnant; 61 (3.3%) were paediatric cases. Of 752 cases with underlying medical conditions; 163 (21.7%) were hospitalised - representing 74.4% of total hospitalised cases, 4.1% were admitted to ICU and 6.8% died. Of 55 total deaths; over 90% occurred in those >65years of age, 92.7% had underlying medical conditions, 49% had heart disease. Of 61 paediatric cases; 55.7% were symptomatic, 14.8% reported underlying medical conditions, 9.8% were hospitalised. There were no ICU admissions or deaths in the pregnant or paediatric cohorts.

Overview of Transmission Classification and Outbreaks

In our study 1,115 cases (60.5%) occurred through 'local transmission', 482 (26.2%) in a healthcare setting; 471 (~25%) occurred via 'community transmission'; 137 (7.4%) were imported. Contact tracing was conducted for >4000 'close contacts' of confirmed cases. One-hundred-and-twenty-eight outbreaks were recorded, with 1,259 outbreak-associated cases, occurring in various settings including; private house (56), nursing home (11), residential institution (21), hospital (9), workplace (8), community hospital/long-stay unit (6), unknown (0) and other (17). Outbreaks occurred most commonly in private houses (56, 43.8%). The highest number of outbreak-associated cases was related to workplace-based outbreaks (324, 25.7%).

Discussion

The regional COVID-19 epidemic evolved with discrete surges in specific settings. From early March 2020 a spike in travel-related cases was temporally linked to increased COVID-19 activity in Italy in particular. Notifications from hospital and nursing home settings also increased rapidly, likely reflecting increased community transmission. Up to end of April 2020 notifications from healthcare and community settings featured prominently, with nursing home and residential institution settings of particular concern. Cases in private houses featured throughout. During the study period, cases in our region declined from mid-March 2020 but from May 2020 resource-intensive local clusters predominated e.g., in workplaces including an outbreak in a food processing plant. While our peak 'epi-date' activity occurred in March 2020, peak 'notification date' activity occurred in April 2020, reflecting early challenges in testing/reporting surge capacity described by this group previously. A quarter of cases did not have a clear source of transmission identified, raising the possibility of asymptomatic transmission. Approximately 7% of cases were imported and we noted a decrease in travel related transmission after a national travel restriction was implemented. From March-April 2020, 29.2% (35/120) of 'close contacts' who became symptomatic and were tested while under 14-day active surveillance in our region developed COVID-19 infection [10]. However, case definitions and broader testing strategies/capacity have evolved since [3].

COVID-19 had a devastating and disproportionate impact on older age groups in our cohort. This mirrors national and international experience [3, 11] and underscores the need for vigilance in vulnerable cohort settings. Sadly, during the first 100 days in our region, fifty-five cases died, most aged >65 years. Case fatality rate (CFR) for that period was 2.99%, while the national CFR was 5.71% for the same period [7]. Nursing home outbreaks accounted for 8.6% of outbreaks in our region, compared with 26.2% of outbreaks nationally [7]. We observed an increased risk of severe illness in cases with underlying medical condition(s) and noted a two-fold increased risk of hospitalisation in that group, highlighting the need for targeted services and preventative measures. Paediatric cases in our cohort largely experienced a mild illness. More recently cases in younger age groups (<45 years) have predominated nationally [3].

Approximately 23% of total cases in our cohort were HCW, which is less than the national figure for that period of 32.1% [7]. While occupational exposure must be considered, local transmission within shared accommodation/social settings was also implicated in some outbreaks, including a food processing plant and residential institutions such as 'direct provision' settings. In our experience, migrant workers, particularly those from non-English speaking communities, are especially vulnerable to household spread and development of familial clusters - due to crowded living conditions and language and cultural barriers. This mirrors international observations [12]. In addition, COVID-19 outbreaks in meat plants pose unique challenges [13]. The importance of social determinants of health and the impact of health inequities on COVID-19 acquisition risk and outcomes have become increasingly evident [14]. Initiatives to reduce health inequities, including multilingual initiatives such as the 'COVID 19 World Service' video messages in 30 languages, are vital and facilitate health protection of wider communities.

Public Health Medicine forms the cornerstone of the national response for prevention and control of COVID-19 in Ireland. Core 'health protection' activities protect the health of the nation by breaking chains of transmission, preventing secondary/tertiary cases and further COVID-19 associated morbidity and mortality. Core activities within regional departments include crucial outbreak control/investigation/management in complex settings such as e.g., schools, childcare-facilities, nursing homes, 'direct provision' centres, prisons, food processing plants amongst many others. Other departmental core activities include identification of transmission source as standard, case finding/management, risk assessment, contact tracing, enhanced surveillance, data management etc. These data help to inform national policy decisions such as those relating to 'Living with COVID National Framework' levels [15]. The novel national contact management programme (which includes contact tracing centres developed for high-throughput of low complexity cases) and the novel contact tracing app. are valuable adjuncts.

Given SARS-CoV-2 transmission dynamics timely testing and reporting pathways are critical to interruption of transmission and innovations such as SARS-CoV-2 wastewater surveillance are welcome.

The potential 'negative impact' of certain NPIs is increasingly recognised [2]. However, the recent SCOPI study reports an estimated national prevalence of infection of 1.7%, indicating that we remain a susceptible population at high risk of community transmission if NPIs are not adhered to [16]. This is compounded by uncertainty regarding post-infection immunity, reports of 're-infection', increasing concerns regarding 'Long-COVID' and other healthcare challenges seen during winter months. Priorities outlined by our acting Chief Medical Officer include protecting our most vulnerable, resumption of non-COVID healthcare and maintaining educational activities [17]. As Dr Mike Ryan WHO tells us 'No one is safe until everyone is safe'. To mitigate the ongoing risk of surge activity, in the absence of a vaccine/curative treatment, sustained engagement with NPIs[2] and robust resourcing of Public Health Medicine in Ireland are vital.

Declaration of Conflicts of Interest:
There are no conflicts of interest to declare.

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