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**Contents of this Issue**

Following on from the discussions at the London Conference in February 2020, I asked contributors if they would agree to a student converting their power-point presentations into short texts. This was partly successful that year and also this year, although they will both be in the next issue.

The first article is the paper presented by Sally Ruane at the Conference. The second article is by the author, making a few comparisons with previous pandemics and also demonstrating the difference in portrayal of the 'League Table' by Death Rates as distinct from Number of Cases. The third article is a tour de force by Sean Demack on pupil segregation in England; and the final short piece is by John Bibby on a variant of Stigler's dilemma.

**Prospects for RSN 130**

We have two articles ready, which have been converted from presentations into papers with the help of an ex-student but, clearly, we are going to have to rely on further contributions from the 2021 Conference and/or anonymous or encouraged contributions.

We are still waiting for follow-ups to the relatively recent publication of the third RadStats compendium, *Data in Society*, which was presented by the books' editors on Saturday 28<sup>th</sup> 2020. It is a landmark publication, bringing together many of the crucial issues around the production and use of quantitative information.

The contributors to *Data in Society* summarise many of the concerns around the accessibility and use of statistics in contemporary society. Examples include the lack of data from banking and financial organisations hides the extent of tax evasion of taxation. Government agencies are reducing the number of data series they make available for public scrutiny. The number of healthcare treatments in Britain provided by private groups is growing steadily.

The book is an eye-opener on the difficulties in holding governments and large organisations to account. Do you agree with the authors' interpretations?

As the editors acknowledge there are data topics the volume does not cover in detail. These include the use of statistics by legal practitioners, housing and homelessness data and climate change data.

The editors of the RadStats journal have been planning to devote one journal issue to topics raised by Data in Society, and to topics not discussed in the book. Could you write an article for the journal on any of the topics above? Are there are areas of debate missing from Data in Society? For example, is anyone prepared to comment on the statistical inequalities arising out of the impact of the COVID-19 pandemic?

### ***Administrative Issues***

As the Administrator informed those receiving printed copies of the issue that, at the AGM held in London at the end of February 2020, the decision was taken to raise the subscription from £25 to £35 for those wishing to continue to receive printed copies (whilst the membership subscription only – with online access - would remain at £25 for those £10 for those on low incomes), otherwise they would be taken off the distribution list which originally includes all 300+ members.

Please make sure you have updated your subscription, *or make a donation!* - by going to [www.radstats.org.uk/membership/](http://www.radstats.org.uk/membership/) where you can pay by cheque, standing order, PayPal - or by filling in your details on page 52.

# **What can statistics tell us about the state of the NHS upon the outbreak of the SARS-CoV-2 pandemic?**

**Sally Ruane**

## **Abstract**

This paper draws upon selected statistics to paint a picture of a National Health Service which was not only ill-prepared for the pandemic, but the resilience of which had been undermined by policy, especially during the decade leading up to the pandemic. The paper argues that financial constraints, failure to care adequately for the workforce and the ongoing closures of hospital beds in a context of rising pressures had resulted in the health service having insufficient capacity to meet health needs even prior to the pandemic. The policy priority of restructuring health services and the shrinking of the NHS estate, reflecting in part inadequate capital investment, distracted attention from pandemic preparedness and reduced the room for flexibility available to NHS managers when large numbers of infectious patients began to be admitted to hospital. Public health had been significantly damaged by reductions in its budget and by its three-way partition in the 2012 Health and Social Care Act, reducing its ability to mount an effective and coherent response to the pandemic crisis. The capacity of primary care and NHS 111 were insufficient to meet need even before the impact of the pandemic was felt and social care, upon which the NHS depends for the effective use of its own resources, had been debilitated by chronic underfunding and the application over many years of competitive market forces in a context of severe financial constraint.

## **Introduction**

When the virus SARS-CoV-2 reached the UK it gave rise to significant levels of Covid-19 disease, with significant implications for the NHS. This short paper discusses different dimensions of pandemic readiness.

## **The funding and capacity of the NHS on the eve of the pandemic**

*Funding of NHS*

The Covid-19 pandemic occurred in the context of a decade of austerity which had significantly damaged public services. Between 1949 and 2010, annual average real terms increases in NHS funding were just under 4% but this plummeted to around 1.4% between 2010 and 2019.

The true impact of this reduction in annual increases can be assessed only when we consider the upward cost pressures faced by the NHS (e.g. changes to the size and age structure of the population, the changing profile of morbidity with a growing incidence of chronic conditions) which had been estimated to be around 4% annually (Roberts et al, 2012; King's Fund, 2021a). The funding settlement reflected an ideological determination in the Conservative Party to reduce public spending as a proportion of GDP. The more recent funding settlement, covering the 2019-2024 period was better - 3.4% for the part of the budget covering health care services. However, even this remained below the 5% thought by experts to be necessary for recovering lost performance, for instance by driving down lengthening waiting lists, and for implementing the 'transformation' of health services sought by government (Hopson, 2018). Thus Covid-19 hit the UK at the end of a decade in which the NHS had received the lowest level of funding relative to the needs it was trying to meet since its creation; despite strenuous efforts to bear down on costs, around £14bn of debts had been amassed across the service by 2020 (Dunhill, 2019).

Thus, the NHS went into the pandemic in a financially straitened position.

### *Workforce*

The under-funding of the health service relative to need resulted in enormous pressure on the service's 1.3m staff (in England) many of whom found themselves being reorganised by their employers for more effective deployment, taking on higher workloads, trying to provide care with fewer staff and suffering 'downbanding' (losing job grade and pay for doing the job or having to take on a higher level of responsibilities to retain the same job grade) (e.g. West, 2020). All of this compromised job satisfaction and both recruitment and retention failed to meet requirements such that by 2018 over 100,000 vacancies had been identified in the service, with overseas nurse recruitment suffering especially badly in the immediate aftermath of the Brexit vote (Beech et al, 2019; RCN, 2020). Over 40,000 of these vacancies were in nursing which suffered a lower rate of workforce growth - 6.2% growth of full time equivalent (FTE) staff between 2010 and 2020 - than the workforce as a whole which grew by 11.9% FTE during the same period (NHS Workforce Statistics, 2020). Consistent with a working context of chronic underfunding and sustained pressure, elements of the workforce experienced worrying levels of turnover, for instance 11.9% in nursing and 13.4% among mental health clinical staff in 2019, and a number of surveys

reported dissatisfaction as reasons for leaving a job (NHS England, 2019). For example, a Nursing and Midwifery Council (2017) survey found 44% of nurses leaving their jobs blamed working conditions, including workload and staffing levels; 27% cited poor quality care; 16% poor pay and benefits. NHS Workforce Statistics reported that work-life balance was the largest single reason cited for leaving (26% in 2018/19) and Halter et al's (2017) systematic review of systematic reviews found multiple determinants of turnover in adult nursing, particularly stress and dissatisfaction, managerial style and supervisory support factors (Beech et al, 2019; Halter et al, 2017). The Care Quality Commission's State of Care 2019/20 report (CQC, 2020:26) noted that 'staffing issues in all regions have been a key factor affecting access to services' (CQC, 2020:26).

Most employers believed the pay restraint in place between 2010/11 and 2017/18, with pay freezes or pay rises capped at 1% such that a nurse's starter salary had lost 10% of its real terms value between 2010/11 and 2017/18, played an important role in the service's staffing problems (Beech et al, 2019). The earnings of staff in health and social care fell further in real terms value than wages in the economy as a whole (Beech et al, 2019). Despite the obvious fact that a health service is only as good as its workforce, health policies have been pursued regardless of their likely impact on staff and the relatively low level of priority placed on strengthening the workforce is evident in cuts in the education and training budget, and the decision to abolish the bursary for most health profession trainees (effective 2017) (Iacobucci, 2015).

This decision was ostensibly to permit the trainee workforce to expand without limits to the public budget requiring a cap on numbers of trainees but it resulted in reductions in applicants for some courses such as nursing (Pisavadia, 2020). Workforce strategy, such as it was, focussed on increasing the proportion of the workforce accounted for by 'support to clinical staff' workers (less qualified supports to clinical workers, typically not on a professional register) which grew by 20.8% FTE in the decade up to the beginning of 2020 (NHS Workforce Statistics, 2020).

Thus, the NHS went into the pandemic with an already depleted workforce.

### *Beds*

NHS beds have been declining in number over many decades: for example, because policymakers have wanted to see more care in community settings, because of changes in cultural practices such as the length of time women are expected to stay in bed after having a baby, or for technological reasons such as keyhole surgery which make short stay or day

case treatment possible. However, even as pressure on acute beds has intensified in the past few years, bed numbers have continued to decline, such that there were around 17,000 fewer beds in February 2020 than there had been in February 2010, including 10,000 fewer general and acute beds (NHS Beds Database, 2010, 2020; Ewbank et al, 2020).

By 2018, the UK had one of the lowest ratios of beds to population in the developed world: the OECD average of 4.5 beds per 1,000 population contrasted with the UK's 2.5; Germany's was 8 (2017) (OECD, 2021). With regard to critical care beds, in early 2020 the UK had fewer than 4,400 at its disposal in March 2020 while Germany had 28,000 (Bauer et al, 2020).

### *Consequences of capacity constraints*

One of the overall consequences of these significant constraints has been a lack of capacity to provide the care needed by patients. For example, on the eve of the pandemic, 17.1% of patients had to wait for more than two weeks for a GP appointment when they wished for something speedier (BMA, 2020). While in February 2010, 90.3% of patients commenced treatment within 18 weeks of a GP referral and 2.34 million people were on the waiting list, by February 2020 these figures had deteriorated dramatically to 83.2% and 4.43 million, respectively (RTT, 2021). Measures to reduce demand for health care had been implemented over several years such as the removal of certain items from the NHS prescription list (meaning they could no longer be obtained free by those entitled to free prescriptions but had to be purchased over the counter); the removal of some procedures from routine NHS availability and the establishment of referral management systems to scrutinise GP referrals to assess whether each referral was really necessary.

Another consequence was the increased reliance of the NHS upon private health sector capacity to provide procedures and diagnostics. There are several policy drivers of increased privatisation of NHS care. One is an ideological belief in what is described as a 'level playing field' in a competitive market and another is the so-called 'choice' agenda. The 2012 Health and Social Care Act increased the use of competitive processes in the awarding of contracts and prohibits commissioners from expressing 'preference' for NHS providers; the Any Qualified Provider policy (whereby private companies and others can apply to be licensed to provide specific services and, once licensed, must receive NHS payment when their services are chosen by NHS patients) mainstreams private sector provision of NHS funded care especially in elective services.

A third policy driver of privatisation is precisely constraints on NHS capacity. Lengthy waits for treatment from NHS providers such as local hospitals incentivise patients to choose alternatives - usually independent sector alternatives. Additionally, the lack of theatre and bed capacity

in NHS hospitals, combined with the ‘emergency patients first’ policy during the winter months when emergency hospital admissions increase, can result in local commissioners (Clinical Commissioning Groups) contracting out some elective care to non NHS providers as the ability of NHS hospitals to provide elective care drops. Moreover, some NHS providers themselves have contracted ‘their own’ work out to private sector providers, for instance because of waiting time targets.

Table 1 below is based on Rowland’s analysis of the ways in which NHS expenditure on non-NHS providers is calculated (Rowland, 2019).

**Table 1 NHS Expenditure on non-NHS bodies**

<b>Expenditure on non-NHS bodies</b>	<b>2013 /14</b>	<b>2018 /19</b>	<b>Change 2013/14 to 2018/19</b>
Purchasing of health care from non-NHS providers by NHS England Group	£6,467m	£13,734m	47%
Purchasing of health care from non-NHS providers by NHS providers	£683m	£1,328m	106%
Total NHS England Group expenditure on independent sector providers	£24,173m	£29,827	23%

Adapted from D Rowland, 2019

By the same token, another consequence of capacity constraints has been the increased dependence of the independent acute hospital medical/surgical and clinic sector on revenues from NHS work: where in 2007, 5% of this sector’s revenues were derived from the NHS, by 2018, this had increased to 32% (Barrett-Evans et al, 2018).

### **Restructuring and reconfiguring health services**

#### *Estate*

Reductions in the number of beds in recent decades has contributed to the reduction in the number of NHS hospitals. Two broad reconfiguration processes have been advanced in government policy over the past two decades or so by which the physical organisation of services has altered: one is a model of reconfiguration in which as many services as possible are transferred out of hospitals into community settings; the other is a model of concentration in which major hospital departments such as maternity and emergency are centralised onto fewer sites. These processes, which predate the past decade, have been more urgently pursued in recent years, in the context of severe financial restraint. Inspired in part by managed care in the United States, the ‘new



models of care' advanced by NHS England look to reduce the amount of care provided in 'high cost' settings (acute hospital settings) and to increase the proportion of care given in cheaper settings with lower overheads (including the patient's own home). These policies permit the sale of hospital estate.

The gradual 'shrinking' of the NHS estate is furthered by cuts to the capital budget which declined by 7% between 2010/11 and 2017/18 (Kraindler et al, 2019), bringing some estate into disrepair, and by the Review of estates undertaken by Sir Robert Naylor, the recommendations of which were adopted by government. The Naylor Review (Naylor, 2017) identified around 1,200 sites owned by NHS Trusts, with a value loosely estimated to be between £9bn and £11bn. He identified a need for around £10bn of capital spending and advocated the sale of around £2.7bn worth of existing estate with the investment of the proceeds into improving the quality of remaining estate.

Quite apart from the closure in decades past of fever hospitals and sanatoria, the more recent policies of reducing available estate and running down the quality of estate arguably reduced the options available to hospital managers in managing large numbers of infectious patients and the flexibility they enjoyed in separating infectious from non-infectious patients.

#### *Health Systems Support Framework*

The shift to new models of care on the basis of accountable care systems and accountable care organisations (currently called, respectively, integrated care systems and integrated care providers) has been the main focus of policy since Simon Stevens' appointment as Chief Executive of NHS England, which steers the NHS and has adopted a strong command and control model. A new framework of 'support' has been put in place to assist NHS organisations in refashioning how they work as they undertake this latest top-down imposed reorganisation. This framework consists of licensed organisations (around 80 of them, almost all of which are private) which can be contracted to provide certain kinds of services such as demand management and capacity planning support, informatics, analytics and digital tools support, and patient 'empowerment' support (NHS England, 2021).

Arguably the dominant focus on reconfiguring services, thinning out estate and implementing top-down reorganisation weakened further the attention that has been paid in the past decade to considerations of pandemic preparedness.

### **The readiness of primary care, public health and social care**

#### *Public health*

This argument might receive further support from developments in public health in the years leading up to the pandemic, itself the largest threat to public health faced by the UK since the second world war. The controversial 2012 Health and Social Care Act split public health provision three-ways such that some of it is provided by public health departments in Local Authorities; some of it is provided by the NHS and some of it is located outside both the NHS and Local Authorities (Public Health England, which is an executive agency inside the Department of Health with regional offices). Concerns about the implications of the loss of coherence arising from this tripartite structure for pandemic management were expressed soon after its implementation (e.g. Pickles and Rowland, 2014).

Public health capability was further undermined by chronically low levels of funding. Money was in fact taken out of the public health budget and given to NHS England to be spent on health services (Iacobucci, 2015). While England's health and social care budget was £150bn in 2019/20, for example, only £3.3bn was planned for public health spending by Local Authorities. Net revenue expenditure on public health services in England decreased by 13% on a like-for-like basis since 2013/14, with significant cuts from 2016/17. Ironically, cuts to spending on health at work were the most severe at almost 50% between 2016/17 and 2020/21 (King's Fund 2021a, 2021b). Meanwhile central government grants to Local Authorities were cut, creating additional pressures on council resourcing.

The timing of these cuts could not have been worse and, combined with the fragmentation of public health provision, created a state of unreadiness. The failure to implement recommendations arising from the Shirley-Quirk Report following the 2016 pandemic simulation exercise (Exercise Cygnus), the deprioritisation of pandemic preparedness in the context of austerity and the privileging of the second partly finance-driven forced health system restructuring in a decade added to the inadequacies of the response in England to the pandemic. This was despite the complacent belief that the strong track record on UK public health responses would see us through (Shirley-Quirk, 2017; Calvert et al, 2020; Pegg et al. 2020).

### *Primary care and NHS111*

Primary care was not in a strong position when the Covid-19 pandemic hit either. GPs and their trade union, the British Medical Association, had been warning for several years that rising workloads were unsustainable. In 2019, there were 312m appointments in GP surgeries, with

numbers of appointments rising. However, full-time equivalent GP numbers had been declining since 2015, despite an increase in the number of training places (BMA, 2020). This was partly because, by December 2019, 45% of GPs were choosing to work less than full-time, working instead on a part-time or locum basis (Triggle, 2019). Alongside this, 45% of ‘GP appointments’ were in fact with non-GP members of a multi-disciplinary primary care team (BMA, 2020). In the context of this shortage of resource in traditional family doctor provision, the public were advised by government to contact NHS111 in the event they experienced Covid-19 symptoms.

NHS111, which is an advice-giving telephone service provided across England via multiple providers, including private companies, was thus entrusted with this responsibility. However, data analysis undertaken by the Health Foundation demonstrates that not only was NHS111 unable to handle the sharp spike in calls which occurred during March 2020 but that it had been answering fewer than 90% of calls in the pre-pandemic period (Vestesson and Gardner, 2020).

**Table 2: NHS 111 calls received and answered in early 2020**

	December 2019	January 2020	February 2020	March 2020	April 2020
No. calls	1,844,804	1,503,318	1,625,240	2,962,751	1,655,146
Change in no. calls on previous year	+191,047	-31,771	+217,407	+1,515,625	+202,702
Calls answered	1,577,276 85.5%	1,329,760 88.5%	1,362,402 83.8%	1,388,916 46.9%	1,254,667 75.8%
Change in calls answered on previous year	+95,499	-29,913	+130,392	+69,665	-68,860

Source: Data from Vestesson and Gardner (2020).

**Social care**

The NHS relies heavily on social care and the interaction between the two came into sharp relief when the decision was made in March 2020 to discharge, from acute hospitals facing rising numbers of Covid-19 admissions, frail older people, often to care homes and nursing homes, without a SARS-CoV-2 test. Unfortunately, the care sector itself was ill-prepared for the pandemic.

Between 2009/10 and 2017/18 overall spending by Local Authorities on adult social care fell by 5% (IFS, 2019). In fact by early 2020, public funding in social care in England was still £300 million *below* the level of funding in 2010 in real terms despite a rise in the number of people requiring social care (Bottery, 2020). The Association of Directors of Adult Social Services estimated the funding gap in adult social care for 2019/20 to be £2.4bn (Economic Affairs Committee, 2019). AgeUK estimated that there were 1.5million people with unmet care needs in 2019, partly due to a tightening of the eligibility criteria for publicly funded social care which had taken place during the decade as budgets shrank (AgeUK, 2019; TUC, 20).

The social care sector is quite different from the NHS in that access to public funding is means tested and provision is fragmented across multiple sectors. The application over many years of competitive market forces in a context of financial constraint had resulted in fragmentation and a low paid, casualised workforce, undermining the quality of care which can be provided. By 2012, only 6% of nursing and residential home beds and 11% of domiciliary care were publicly provided (Fotaki et al, 2013). The 2019 Skills for Care report (SfC, 2019) found that in England 18,500 organisations were providing adult social care employing 1.5 million people. Various factors contributed to the marginalised status of this workforce. The vast majority of employees (82%) were female and a significant number (17%) were non-British national (TUC, 2020). More than 50% of organisations employed fewer than 10 people. 145,000 people worked for direct payment recipients who hire their own care staff. Workers were fragmented across the private sector, third sector, local authority sector, NHS and direct payment employers, with the largest proportion (59%) in the private sector (SfC, 2019).

The social care workforce is also highly casualised, with 25% of the overall workforce and 35% of care workers on zero hours contracts. Twenty per cent of care workers were on the minimum wage and the mean hourly wage was only 50p higher. Moreover, over 50% of the social care workforce not subject to professional regulation had no care qualifications (SfC, 2019). The unvalued character of the workforce has led, inevitably, to high levels of turnover with 30.8% of turnover among directly employed staff (440,000 individuals) (SfC, 2019) and 40% among care workers (CQC, 2019). The vacancy rate stood at 7.8% (SfC, 2019) and staff shortages, particularly among specialist staff tend to lead to imperfect skill mix, a tendency towards a production line approach and a reliance upon agency staff.

These conditions contributed significantly to the unpreparedness of the care sector at the start of the pandemic. The shortage of staff may have

been literally fatal as many employers relied on agency staff, a reliance which is thought to have helped spread the infection among care homes. The fragmented, highly privatised care sector does not share the strong cultural identity enjoyed by the NHS in the UK and its overworked, underpaid workers are not organised into strong trade unions and professional associations such as the BMA and RCN. Both of these factors arguably contributed to the delays in attending to the needs of the care sector during the early weeks of the pandemic, particularly in relation to personal protective equipment when the better organised more visible doctors and nurses of the NHS were taking to social and mainstream media directly and were effective in raising public awareness and placing acute pressure on government to act. To make matters worse, the government appeared to have failed to act on the recommendation in the Shirley-Quirk Report that action needed to be taken to ensure the care sector could expand adequately to cope with the surge in demand arising from the ‘reverse triage’ of rapidly discharging patients from hospitals to care sector (Shirley-Quirk, 2017; Pegg et al, 2020).

### **Conclusion**

The NHS, like the social care sector, was poorly positioned to cope when the SARS-CoV-2 pandemic hit the UK in 2020. It had been debilitated after years of under-resourcing, both in terms of funding and in terms of workforce. The emphasis upon running down bed numbers and sweating the estate left the NHS with little room for manoeuvre when an infectious illness required surplus capacity and flexibility in the use of physical space. The decision in 2015 to take money *out* of the staff training and public health budgets in order to transfer resources to equally hard-pressed health care services represented a counter-productive, short-sighted and even possibly lethal exercise in robbing Peter to pay Paul. It is a matter of irony that the ‘integrated care systems’, emerging from the ‘new models of care’ beloved of Simon Stevens and the government, are supposed to be predicated upon a strong preventative and public health function to reduce demand for health care. Meanwhile, the focus on driving down the unit cost of health care, restructuring services and paring back what was already limited (in international terms) and overly-pressured hospital capacity, distracted attention from effective pandemic planning and resulted in a de facto deprioritisation of pandemic readiness.

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# History of Pandemics; how deadly were they? Where has COVID had the highest death rates?

Roy CARR-HILL

## Introduction

The author makes no claim here that any of the material reported here is novel; it is more like a trade catalogue of pandemic 'goodies' than an academic analysis. It just seemed an appropriate point to bring together what is known about previous pandemics to put the current COVID-19 pandemic in context.

## Bubonic Plague/ the Black Death

The most well-known historical plague is the Bubonic plague, commonly called the Black Death, caused by the plague [bacterium](#) (*Yersinia pestis*). One to seven days after exposure to the bacteria, [flu-like symptoms](#) develop. These symptoms include fever, [headaches](#), and vomiting. Swollen and painful [lymph nodes](#) occur in the area closest to where the bacteria entered the skin. Occasionally, the swollen lymph nodes, known as "[buboes](#)" may break open.

The three types of plague are the result of the route of infection: bubonic plague, [septicemic plague](#), and [pneumonic plague](#). Bubonic plague is mainly spread by infected [fleas](#) from small [animals](#). It may also result from exposure to the body fluids from a dead plague-infected animal. Mammals such as rabbits, hares, and some cat species are susceptible to bubonic plague, and typically die upon contraction. In the bubonic form of plague, the bacteria enter through the skin through a flea bite and travel via the [lymphatic vessels](#) to a [lymph node](#), causing it to swell. Diagnosis is made by finding the bacteria in the blood, [sputum](#), or fluid from lymph nodes.

Prevention is through public health measures such as not handling dead animals in areas where plague is common. [Vaccines](#) have not been found to be very useful for plague prevention. Without treatment, plague results in the death of 30% to 90% of those infected. Death, if it occurs, is typically within 10 days. With treatment (antibiotics), the risk of death is around 10%. Globally between 2010 and 2015 there were 3,248 documented cases, which resulted in 584

deaths. The countries with the greatest number of cases were the [Democratic Republic of the Congo](#), [Madagascar](#), and [Peru](#).

The plague was the cause of the [Black Death](#) that [swept through Asia, Europe, and Africa](#) in the 14th century and killed an estimated 50 million people. This was about 25% to 60% of the European population. At the global level, there were estimated to be between 390 and 450 million so the death rate was approximately rate between 11% and 13%. Because the plague killed so many of the working population, wages rose due to the demand for labour. Some historians see this as a turning point in European economic development. The disease was also responsible for the [Plague of Justinian](#), originating in the [Eastern Roman Empire](#) in the 6th century CE, as well as the [third epidemic](#), affecting [China](#), [Mongolia](#), and [India](#), originating in the [Yunnan Province](#) in 1855. The term *bubonic* is derived from the Greek word [βουβών](#), meaning "groin".

### **Smallpox**

Smallpox caused by the virus variola minor, is one of the deadliest known to humans, first recorded about 1520. It caused fluid-filled pustules to develop all over the body and at its height, about three out of every 10 people with the disease died. It could be spread via droplets from an infected person's nose or mouth or via their sores.

But, the disease has been completely erased thanks to a vaccine developed in 1796 by British doctor Edward Jenner and the efforts of the scientific community - although it took nearly two centuries to do so. Smallpox remains the only human disease to have been eradicated this way. Prof Riley regards this feat as one of the greatest achievements of mankind - rivalling the Moon landings: "It could be seen as the greatest return on a public investment ever," he says, referencing the annual savings the world has enjoyed thanks to the absence of the disease.

Like the bubonic plague, smallpox killed hundreds of millions of people - 300 million in the 20th Century alone - with total estimates up to 500 million. The average population in the 20<sup>th</sup> century was 3.8 billion, so the global death rate was about 13% during that century alone, although by then, most of Europe had been inoculated so most of those deaths took place in Africa, Asia or Latin America.

### **1918 flu pandemic**

More commonly referred to as the **Spanish flu**, this was an unusually deadly [influenza pandemic](#) caused by the [H1N1 influenza A virus](#). Lasting from February 1918 to April 1920, it infected 500 million people – about 30% of the world's population of 1.7 billion at the time – in four successive waves. The death toll is typically estimated to have been somewhere between 20 million (1.2%) and 50 million (3%) of the world's population, although estimates range from a conservative 17 million (1%) to a possible high of 100 million (6%) of the, making it one of the [deadliest pandemics](#) in human history.

The first observations of illness and mortality were documented in the [United States](#) (in [Kansas](#)) in March 1918 and then in April in [France](#), [Germany](#) and the [United Kingdom](#). To maintain morale, [World War I](#) censors minimized these early reports. Newspapers were [free to report](#) the epidemic's effects in neutral [Spain](#), such as the grave illness of [King Alfonso XIII](#), and these stories created a false impression of Spain as especially hard hit. This gave rise to the name "Spanish" flu. Historical and [epidemiological](#) data are inadequate to identify with certainty the pandemic's geographic origin, with varying views as to its location.

Most influenza outbreaks disproportionately kill the very young and the very old, with a higher survival rate for those in between, but the Spanish flu pandemic resulted in a higher-than-expected mortality rate for young adults. Scientists offer several possible explanations for the high mortality rate of the 1918 influenza pandemic, including a severe 6-year climate anomaly that affected the migration of disease vectors and increased the likelihood of the spread of the disease through bodies of water. Some analyses have shown the virus to be particularly deadly because it triggers a [cytokine storm](#), which ravages the stronger [immune system](#) of young adults. In contrast, a 2007 analysis of medical journals from the period of the pandemic found that the [viral infection](#) was no more aggressive than previous influenza strains. Instead, malnourishment, overcrowded medical camps and hospitals, and poor [hygiene](#), all exacerbated by the recent war, promoted bacterial [superinfection](#). This superinfection killed most of the victims, typically after a somewhat prolonged death bed.

*How did the Spanish flu pandemic end and what lessons can we learn from a century ago?*

### **History repeating itself**

"It feels like a time machine, everything we had investigated is becoming a reality day by day," Spanish historians Laura and María Lara Martínez told Euronews. The sisters have been studying the

1918 flu for the past two years and the parallels between today's coronavirus outbreak and the 1918 Spanish flu were clear to them from the start. The remainder of this section is based on the transcript of that broadcast.

In the spring of 1918, the disease emerged in pockets across the globe and at first seemed as benign as the common cold. Soldiers in the trenches in France became ill with what was known as la grippe. They complained of sore throats, headaches and a loss of appetite. Although the illness was highly infectious, and the primitive, crowded conditions made rapid spread inevitable, recovery was swift and doctors at first called it "three-day fever".

But it was swiftly realised this was no ordinary flu. Glasgow was the first British city to be affected, in May 1918, and within weeks the illness had spread south, reaching London by June. During the next few months, 228,000 people died in Britain.

#### *Characteristics of Spanish Flu Pandemic*

About a fifth of those infected developed pneumonia or septicaemia. Often this progressed to heliotrope cyanosis, a lavender hue of the skin that signalled shortage of oxygen and imminent death. Onset was devastatingly quick. Those hale and hearty at breakfast could be dead by tea-time. There was no available or known cure.

In 1920, a UK Ministry of Health report noted that unlike ordinary seasonal flu, which was worst in the elderly, weak and sick, the new illness disproportionately struck those aged 20 to 30. Young adults with the strongest immune systems were, unexpectedly, the most vulnerable. It is speculated this is because the older generation lived with the so-called Russian flu in 1889 and 1890.

London, like other British cities, was ill-equipped to cope with the epidemic. The war had cost the country most of its fortune, industry was disrupted, there was damage to public services and millions were dead, missing or wounded. And ships were bringing soldiers back from the front carrying the virus to their homes and communities. Hospitals were overwhelmed, and doctors and nurses worked to breaking point, although there was little they could do. Medical schools closed their third- and fourth-year classes and students helped in the wards. There were no treatments against the flu and no antibiotics to treat complications such as pneumonia.

In many towns, theatres, dance halls, churches and other public-gathering places were shut, some for months. Streets were sprayed with chemicals and people wore anti-germ masks. Some factories relaxed no-smoking rules believing that cigarettes would help prevent infection.

### *Spread of Spanish Flu*

The pandemic circled the globe. No country was spared, except Australia which imposed strict quarantine rules. Entire Alaskan villages were overcome by the virus and Western Samoa, a small island in the Pacific, lost 20 per cent of its population. Worst-hit was India where an estimated 12 million people died. By the end of the pandemic, a fifth of the world's population had fallen sick.

In the US, the first case was recorded on Monday, 11 March, 1918, at Fort Riley in Kansas, a military training camp. A cook, Albert Gitchell, reported to the hospital with a "bad cold". He was feverish, and complained of a sore throat, headache and muscular pains. By noon that day, 107 patients had been admitted with similar symptoms. Within five weeks, 1,127 men out of 26,000 in the camp, were infected.

The death rate was relatively low in this first outbreak but the second wave which started in Boston in the early autumn was much more severe. The virus appeared to have mutated over the summer. Philadelphia, hardest-hit of all US cities, was struck in October with 700 deaths in the first week, 2,600 by the second week and 12,162 by 2 November. Churches and schools were closed but the newspapers, as did those in Boston and other US cities, continued to devote their front pages to news from the battle front in Europe.

As flu deaths rose, cemetery keepers could not keep up. Families had to dig their own graves and there was a shortage of coffins. Louise Abrucchezze, an Italian immigrant, said a neighbour became distressed at how the corpse of a family member was being treated and begged the undertaker: "Please, please, let me put him in a macaroni box." Wooden boxes were used then to hold 20lb of pasta.

The effect of the epidemic on the US was so severe that the average lifespan was cut by a decade. Some towns tried to restrict travellers or impose quarantine, with limited success. One banned shaking hands. Funerals were limited to 15 minutes and bodies piled up in

warehouses. The pandemic peaked in the summer and autumn of 1918, as crops were ripening, but there were no field-hands to get the harvest in. "It was an agricultural disaster," one report said.

As the illness swept Europe, Spain was hardest hit, with an estimated eight million dead which led the BMJ to label the disease "Spanish flu", though it is thought to have originated in China. One of the earliest casualties was the King of Spain. A third wave of the pandemic struck in early 1919 but it died away swiftly.

The disease that had wreaked such havoc disappeared almost as quickly as it had come. Forty million people had lost their lives. The death rate was 25 times higher than in a normal flu epidemic (2.5 per cent compared with 0.1 per cent).

On 3 November 1918, the News of the World suggested ways to combat the epidemic which are equally relevant today:

"Wash inside nose with soap and water each night and morning; force yourself to sneeze night and morning, then breathe deeply. Do not wear a muffler; take sharp walks regularly and walk home from work; eat plenty of porridge." Possibly, the porridge may be optional.

Armistice Day on 11 November, called to mark the end of the war, set off a second wave of infection. As people gathered to celebrate, the virus swept through them. Parties and parades turned to disaster. Rich and poor were at risk; the virus spared no one. Cristina Garvin, wife of the editor of The Observer during the First World War, was reported by her daughter to have cried through all the rejoicing and saying, 'It is too late for me'. Nearly [two] months later she died.

### *Death Rates*

There were 228,000 deaths reported in Britain, which puts the death rate then at 0.54% or 0.49%. Our current UK death rate from COVID-19 is 0.19%.

It's also worth noting that, globally the **lowest** estimate of deaths from the pandemic is 17 million, which was 1.0% of the global population then of 1.7 billion, compared to the current 4 million COVID-19 deaths which is 0.05% of the current global population of 8 billion. The more widely promulgated higher estimate of 50 million deaths puts the death rate at nearly 3% of the global population,

*And Today*

The lockdown measures put in place over a century ago sound familiar today: theatres, schools and borders were all closed. Public spaces, including telephones, were disinfected, historians say and in the United States, people could be fined up to \$100 for not wearing a mask. In 1918, it was quickly understood that crowds could cause further transmission.

"Lockdowns were put in place and progress was made in the application of preventive measures that had historically proven effective," historian [Jaume Claret Miranda](#) told Euronews. This included hygiene measures and quarantining those suspected of being contaminated. At the same time, people did have "to fight against superstitions," Claret added. "For example, in Zamora the bishop called for mass that contributed to the effects of the pandemic and in Madrid, authorities did not cancel the San Isidro festivities."

Indeed, the first wave of the outbreak in Spain took place just after the celebrations of the patron saint of the Spanish capital. A week later, around May 22, newspapers said that everyone was falling ill with the flu. This fuelled the naming of the new flu as "Spanish" even though patient zero was at a US military training centre in Kansas.

Historians Laura and María Lara Martínez say that the 1918 flu could have originated even earlier in China or in France in 1917. However, Spain's neutrality in the First World War meant that the journalism coverage of the new disease was more extensive.

**'The mother of all pandemics'**

Without hope of a vaccine or test, those fighting the 1918 pandemic faced different challenges and some expected summer temperatures to slow the virus' transmission. The second wave of the epidemic, however, was more deadly than the first. In Spain it coincided with harvests and celebrations in September as well as the relaxation of lockdown measures, the Lara Martínez sisters said.

Outbreaks occurred the following winter, said Jaume Claret Miranda, who added that in some areas there was a third wave in the early 1920s. "The end of the pandemic depended on each country: on the information and training of its specialists and the interests of its political class," says Claret. But historians' "knowledge is very limited

to the 'western world' and we do not know how this epidemic played out in many other parts of the world," he added.

Academics agree that the end of the pandemic occurred in 1920, when society ended up developing a collective immunity to the Spanish flu, although the virus never completely disappeared.

"Traces of the same virus have been found in other flu viruses," said Dr Benito Almirante, head of infectious diseases at the Vall d'Hebron hospital in Barcelona. "The Spanish flu continued to appear, mutating and acquiring genetic material from other viruses." For example, the 2009 flu had genetic elements from earlier viruses, so older individuals were better protected than the young, he said. This also occurred in 1918-20 with the 'Spanish' flu, with those over the age of 30 having better survival rates, said Laura Lara Martínez.

### *When does a pandemic end?*

A pandemic ends when there is no uncontrolled community transmission, and cases are at a very low level, said Dr Almirante. This is the current situation [with the coronavirus] because the cases are easily identified and they can be tracked. If this continues in the coming weeks, the pandemic can be considered controlled." But, when people ask, 'When will this end?,' they are asking about the social ending," Dr Jeremy Greene told the [New York Times](#).

Social fear varied according to the degree of information available and how countries were affected by the war, explains Claret. For example, England's field hospitals stayed up past the end of the war due to the outbreak

### *Post-pandemic euphoria*

The roaring 20s followed the Spanish flu pandemic and World War I. "The population that ... survive(d) entered a phase of euphoria" including economically. The Lara Martinez sisters compared it to "the dances of death" during the fourteenth century Black Plague. "Living with death, because it can appear at any time." But in this optimistic post-flu phase, totalitarian regimes began to emerge as the breeding ground for border control and the (misplaced) desire for security.

"People's memory is short," Claret said. "However, it did leave a certain legacy at the scientific level and among specialists, confirming



and adding knowledge to how these epidemics should be treated." The main lesson, was that "any measure" before the pandemic that was described as "exaggerated [is] later considered insufficient."

## **COVID19**

Current (18<sup>th</sup> June 2021) global infection cases and death numbers are approaching 180 million and 4 million respectively. With an 8 billion (global) population this translates into 2.25% infection rates and 0.05% death rate. It is difficult to believe the infection numbers and rates because that would depend on the accuracy and reliability of reporting systems around the world. Death numbers and rates should be more reliable; nearly all countries have mandatory systems of reporting deaths and there is often an incentive for descendants to report the deaths for financial reasons. But, of course, it is also crucial to use the rates rather than the numbers in order to understand the severity of the pandemic. For all of these reasons, the comment focuses on the death rates rather than on the infection rates.

## **CURRENT DEATH RATES**

Figures in the table are from *World-o-Meter 16<sup>th</sup> June*, but the death rates have been rounded up (by guesswork) to account for publication delay. Only countries reported to have death rates greater than 1,500 per million are included. The discordance between cases per million and deaths per million are striking.

The country with the highest death rate is not India (280 per million) nor Mexico (1,780 per million); neither is it USA (1,850 per million), UK (1,880) nor Italy (2,100); but instead it is Peru (5,680). And, in Europe Hungary (3,100) has the highest rate and in Western Europe Belgium (2,150 per million) the highest. I don't think you will find a single mention of Belgium in the media!

Perhaps more interesting is that more than half of those countries with death rates of 2 per thousand or higher were part of the former Soviet Union or Yugoslavia which is surprising given that their medical systems were acknowledged to be very good at the time.

	<b>Country</b>	<b>Total Cases</b>	<b>Total Deaths</b>	<b>Tot Cases/ 1M pop</b>	<b>Deaths/ 1M pop</b>
1	Peru	2,023,179	189,933	60,551	5.680
2	<a href="#">Hungary</a>	804,538	29,733	83,476	3,110
3	<a href="#">Bosnia and Herzegovina</a>	204,012	9,253	62,539	2,960
4	<a href="#">Czechia</a>	1,661,272	30,108	154,867	2,830
5	<a href="#">Gibraltar</a>	4,295	94	127,516	2,800
6	<a href="#">San Marino</a>	5,089	90	149,694	2,650
7	<a href="#">North Macedonia</a>	155,272	5,413	74,532	2,630
8	<a href="#">Bulgaria</a>	418,274	17,662	60,614	2,610
9	<a href="#">Montenegro</a>	99,623	1,584	158,600	2,560
10	<a href="#">Brazil</a>	16,515,120	462,092	77,197	2,340
11	<a href="#">Slovakia</a>	389,721	12,343	71,351	2,290
12	<a href="#">Belgium</a>	1,061,200	24,940	91,203	2,170
13	<a href="#">Slovenia</a>	253,722	4,375	122,029	2,130
14	<a href="#">Italy</a>	4,217,821	126,128	69,854	2,110
15	<a href="#">Croatia</a>	356,181	8,026	87,253	2,001
16	<a href="#">Poland</a>	2,872,283	73,745	75,969	1,980
17	Argentina	4,242,763	88,247	93054	1,950
18	<a href="#">Colombia</a>	3,383,279	88,282	65,853	1,930
19	<a href="#">UK</a>	4,487,339	127,782	65,786	1,880

20	<a href="#">USA</a>	34,043,582	609,556	102,304	1,855
21	<a href="#">Mexico</a>	2,412,810	223,507	18,537	1,780
22	<a href="#">Spain</a>	3,678,390	79,953	78,646	1,730
23	<a href="#">France</a>	5,667,324	109,528	86,649	1,700
24	<a href="#">Portugal</a>	849,093	17,025	83,493	1,680
25	<a href="#">Chile</a>	1,384,346	29,300	71,856	1,630
26	<a href="#">Romania</a>	1,077,737	30,312	56,366	1,700
27	<a href="#">Moldova</a>	255,186	6,107	63,394	1,540
28	<a href="#">Armenia</a>	222,670	4,438	75,016	1,520
29	<a href="#">Panama</a>	377,776	6,370	86,320	1,480
30	<a href="#">Sweden</a>	1,068,473	14,413	105,200	1,440
31	<a href="#">Andorra</a>	13,727	127	177,402	1,650
32	<a href="#">Liechtenstein</a>	3,012	58	78,790	1,550
	<b>Total:</b>	<b>171,269,263</b>	<b>3,561,732</b>	<b>21,972.2</b>	<b>470</b>

2	<a href="#">India</a>	28,171,955	331,882	20,233	280
5	<a href="#">Turkey</a>	5,249,404	47,527	61,639	580
6	<a href="#">Russia</a>	5,071,917	121,501	34,741	890

**Comparing global death rates across pandemics**

Bubonic plague 11%-13%; smallpox (20<sup>th</sup> century) 13% (nearly all deaths outside Europe or America); Spanish flue (between 1% and 3%); with COVID-19 trailing at 0.05%. Economies suffered badly with the Bubonic plague, Smallpox and Covid 19 but rebounded with the first two; what will happen with COVID-19?

## **Inequalities of Impact in the UK**

The higher rates for the elderly and Black and Ethnic Minority communities are well known. Perhaps less well publicised are that insecure and gig-economy workers are twice as likely to die from Covid-19 as those in more secure work (TUC, 2021).

Lack of sick pay, fewer rights and endemic low wages, combined with occupations that frequently expose people to the virus, have contributed to a mortality rate among insecure workers double that among others, according to the TUC. Among male workers without guaranteed regular hours or income, or in low-paid self-employment, the Covid-19 death rate between March and December last year was 51 per 100,000, compared with 24 for those in more secure work. Women in similarly insecure work faced a mortality rate of 25 per 100,000, compared with 13 per 100,000 for those with less job insecurity. Moreover, insecure workers are almost 10 times more likely than others to receive no sick pay at all.

The TUC called for sick pay to be raised to the level of the real Living Wage and available to all workers, and zero-hours contracts and false self-employment banned. One worker in nine is in insecure work, and that women, disabled workers and black and minority ethnic (BME) workers are far more likely to be in precarious work — almost half of workers on zero-hours contracts are from ethnic minorities.

Those in insecure occupations have largely continued to work outside the home during the pandemic, many being key workers whose undervalued role has been thrown into relief by the crisis. In Britain nearly two million workers do not earn enough to qualify for sick pay. This reduces the prospect of a safe return to work and forces many to choose between doing the right thing and putting food on the table.

Katie Schmuecker of the Joseph Rowntree Foundation said: “The risks of the pandemic have not been borne equally, with women, disabled and BME workers the most likely to be in precarious work.”. The foundation’s research has shown that people on zero-hours or temporary contracts were four times more likely to lose their job during the first lockdown, while self-employed people were three times more likely to stop working than permanent workers.

Based on the report in GUARDIAN 16<sup>th</sup> April; **Zero-hours contracts**

# National Social Register: An approach to Social Protection and Poverty Reduction in Nigeria.

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**Abstract:** *Nigeria is challenged by growing level of poverty and vulnerabilities in the face of economic growth. In 2004, Nigeria's absolute poverty measurement stood at 54.7%, but increased to 60.9% in 2010 (NBS 2012), as of 2019 the national poverty rate stood at 40.1%, equivalent to 82.9 million Nigerians. Giving an average GDP growth rate of (2%) and high population growth rates of (3.2%); and coupled with recent spate of insurgencies, banditry, herdsman clashes, recession and the impact of COVID-19, more vulnerable people would be expected to fall into poverty. Previous efforts with social protection had been fragmented, unstructured and mired by both technical factors and political interest. Documentation had also been lacking on coverage, design and implementation of the programs or a clear articulation of the processes for targeting poor and vulnerable households (PVHHs). Current efforts, though slow and tedious, are building verifiable systems for targeting which minimizes errors of inclusion and exclusion, while building concrete evidence of the population of interest. This paper presents a working approach to building a national and sub-regional single register of PVHHs using geographic targeting, community ranking, community-based targeting and proxy mean testing (PMT). To this end, Nigeria is building the body of knowledge around targeting approaches that is workable in sub-Saharan Africa using accurate, cost effective, sustainable, and justifiable mechanisms to guide long term investment across all social protection floors for various programmes. Thus, as of March, 2021, the National Social Register (NSR) has a total of 7,653,684 PVHHs households, out of which 61% male are heads of household while 39% are female heads of households. The households translate into 32,682,171 individuals (49% male and 51% female). This achievement was not realised without the challenge of tackling the errors of inclusion and exclusion.*

**Keywords:** Targeting, single register, intervention, poor and vulnerable households

## **1. Background and Context**

Poverty is a global phenomenon, and every country bears the share of its attendant consequences. In Nigeria, despite strong economic growth in the past, the number of absolute poor in 2004, rose from 54.7% to 60.9% in 2010 (NBS 2012), by 2019 it was estimated that Nigeria had 40.1%, equivalent to 82.9 million Nigerians (NBS 2019). Life expectancy stood at 53.5 in 2016, and 54.8 in 2019 (UNDP 2020). Similarly, human development index rose from 0.482 in 2010 to 0.539 in 2019. Accordingly, the UNDP (2009) as reported in the ODI Social Protection in Nigeria (2012) reported that approximately 20% of Nigerians own 65% of the national wealth; and the gini coefficient was as of 2019 was 35.1%. Compared to South Africa, which has a gini coefficient of 0.65 as of 2015<sup>1</sup> and Egypt with 31.5% as of 2017, Nigeria and Egypt are very unequal society. This reality amid abundant resources, underscores the fact that, relatively high and stable economic growth in recent years has not translated into economic opportunities and income for poor households. It also implies that, the plethora of social protection programs implemented in the past failed to achieve their desired results, hence, leaving the preponderance of Nigerians under the poverty line (Victor, 2018).

The abysmal performance of past social protection interventions was a source of concern to the government of Nigeria, and of course Nigerians in general. Thus, in 2016, the Nigerian government, took a decisive step with the assistance of the World Bank to address poverty in a more strategic and scientific approach through the establishment of the National Social Safety Nets Programme (NASSP). NASSP, in turn, through the World Bank Loan Facility supported the establishment of the National Social Safety Nets Coordinating Office (NASSCO) at the federal level to coordinate and establish the building blocks for social safety nets interventions. NASSCO is also saddled with the responsibility of targeting and registering poor and vulnerable households into the single National Social Register (NSR), which is aggregated from States Social Registries (SSRs) to be used for pro-poor interventions, namely among others: (a) targeted regular cash transfers to poor and vulnerable households identified through the NSR (b) Labour-intensive public workfare for poor youths ages 18–35 whose

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<sup>1</sup> <https://www.statista.com/statistics/1127890/gini-coefficient-in-south-africa-by-area/#:~:text=According%20to%20the%20latest%20governmental,most%20southern%20country%20of%20Africa.>

education level is below Junior Secondary 3 (c) Skills for jobs for low-income youth of 18–35 years with at least a Junior Secondary 3 education (d) one-time or occasional cash transfers to displaced persons identified through existing IDP registries who are returning home or being resettled.

The objective of this paper is to: share experience on building a single registry; the targeting mechanism adopted by Nigeria; status of the NSR; showcase demographic characteristics of the poor and vulnerable households; illustrate the interventions mining from the NSR; and identify challenges confronting the project as well as policy implications deriving from community profile.

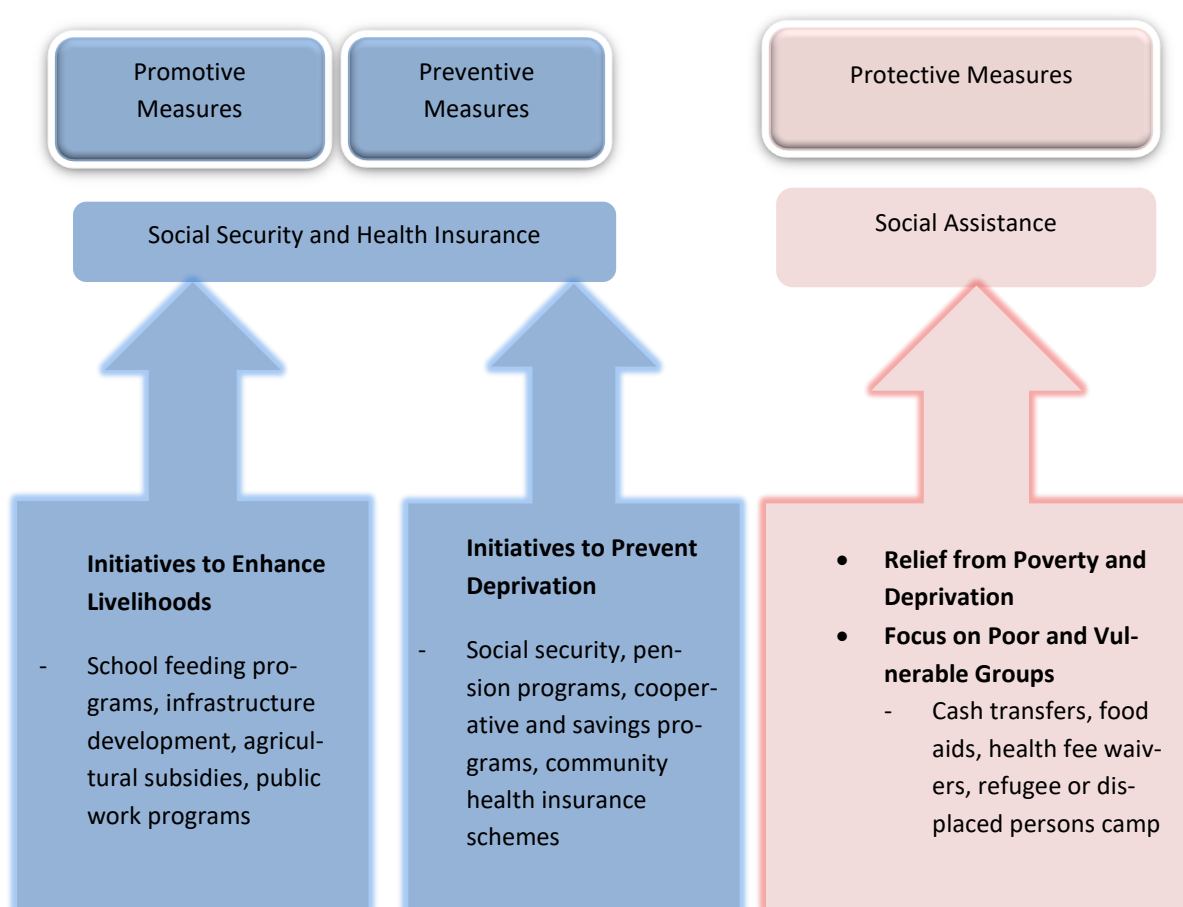
## **2. Why Social Protection in Nigeria?**

With a population of approximately 190 million people, Nigeria has the largest population in Africa and the 7th largest in the world (World Bank, 2017). It is the 12th largest producer/exporter of petroleum worldwide with an annual Gross Domestic Product of USD262.6 billion in 2013 and an annual growth rate of around 6.6% (National Health Demographic Survey, 2014). However, Nigeria has one of the highest numbers of people living in poverty and inequality. According to the National Bureau of Statistics (NBS) National Poverty Index report, 2012, about 112 million Nigerians (or 67.1 per cent of the country's total population) live below poverty level, living below US\$1.00-US\$1.25 per day. Nigeria ranked at the bottom 152 out of 158 countries with low Human Development Index (HDI), as of 2015.

Poverty and vulnerability in the country are highly influenced by several factors. Closer study of poverty dimensions in Nigeria show that income inequality is just one aspect of poverty. Poverty and vulnerability are also highly influenced by social and other factors, gender, ethnicity, geography, and age. Other influencing factors are socio-cultural and religious norms and the prevalence of conflict and instability in the northern region (such as the Boko Haram crisis) and slowly crawling towards the southern region is the spate of insecurity. Similarly, poverty and vulnerability level has also been aggravated by economic recession and the more recent food, fuel and financial crisis. This has resulted to widening of inequality and poverty gap between the poor and rich in Nigeria, hence increasing the population of the poorest of poor, and making their condition more precarious.

In response to a recognized increase in poverty and vulnerability, social protection (SP) emerged in the early 2000s in Nigeria and has advanced with incredible speed. According to the International Labour Organization (ILO, 2007), SP is a set of public measures, provided by the government for its citizens, to shield them against economic and

social distress that would be caused by the absence or a substantial reduction of income from work due to various contingencies such as illness, unemployment, old age, and death of the breadwinner. SP systems help individuals and families, especially the poor and vulnerable, cope with crises and shocks, find jobs, improve productivity, invest in the health and education of their children, and protect the aging population (World Bank, 2014). It protects the most vulnerable from shocks and stresses throughout their lives. SP is today widely seen as an important component of poverty reduction strategies and efforts to reduce vulnerability to economic, social, natural, and other shocks and stresses (Sanfilippo et al., 2012).



**Figure 1: Social Protection Measures**

According to ILO, SP can be distinguished as promotive, protective and/or preventive mechanisms utilized to address the complex, interrelated and multi-dimensional issues of poverty (Devereux et al., 2014: 4). As shown in the Figure 1, social protection measures are interrelated and can have an impact in the lives and livelihoods of an



individual or groups of individuals. Protective measures (also known as social assistance initiatives) are utilized to support those dealing with poverty and vulnerability, as well as assist in provision of support particularly for those without the means to earn an income or other means of subsistence. Promotive and preventative measures do differ as instruments of social protection, but measures utilized can overlap as initiatives could both prevent individuals from shocks in addition to promoting opportunities for them to find sustainable means to become less vulnerable and more capable to establish and maintain livelihoods (Thakur, 2009: 168).

A well-designed and implemented SP system can powerfully shape countries, enhance human capital and productivity, reduce inequalities, build resilience and end inter-generational cycle of poverty. Such systems and tools are transformative as they not only help the poor and most vulnerable mitigate economic and fiscal shocks but also help ensure equality of opportunity by giving them a chance to climb out of poverty and become productive members of society.

Sustainable poverty reduction can be achieved through targeted SP interventions, which take the form of cash or food transfer (Devereux, 2014). Over the last decade and a half, the most popular form of social protection across diverse developing countries is the provision of conditional/unconditional cash transfers; although these are increasingly combined with other interventions targeting human development (Gertler and Fernald, 2004). It is argued that SP is the set of public as well as private policies targeted at mitigating the economic and social vulnerability of children, women, and families to guarantee their access to an acceptable standard of living (UNICEF, 2012).

## **2.1 Overview of the National Social Safety Nets Project**

Upon the assumption of office by the current administration of the Federal Government of Nigeria in May 2015, it embarked on implementation of social investment initiatives that are targeted at reducing poverty and empowering millions of Nigeria. The thrust of implementing these initiatives is based on the Federal Government Social Protection Programme plan, which also has one of its main pillars of implementation in the introduction of the National Social Safety-Net Programme (NASSP) in 2016.

The Government of Nigeria has now prioritized SP interventions as a key strategy towards reducing poverty and socio-economic vulnerabilities in the population; and in line with this, has partnered with the World Bank to design the National Social Safety Net Project (NASSP). This is aimed at dedicating national resources to improve the lives of citizens and strengthen the role of social protection in helping to distribute resources

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more broadly. NASSP involves two components: (i) establishing systems for social safety net that would serve as a robust platform for effectively targeting and delivering social assistance; and (ii) implementing cash transfers to targeted poor and vulnerable households. The program has national coverage, with all states eligible to participate. The systems developed for social safety net in Nigeria will be used across the country's different safety net programs, irrespective of funding source or targeted beneficiary group. Different stakeholders, such as governments, development partners, or civil society, will be able to use the systems for delivering social assistance programs in Nigeria.

To ensure proper coordination and support to NASSP, the Government established the National Social Safety Nets Coordinating Office (NASSCO), at the federal level, to coordinate all social safety nets (SSNs) interventions, including the Conditional Cash Transfer (CCT), the Youth Empowerment and Social Operations (YESSO) and the Community Social Development Project (CSDP); and set up standards to support SSN interventions in the country.

NASSCO was thus, established to coordinate and drive the implementation of SP interventions in Nigeria. Having implemented its activities of building a single social registry for the country to a reasonable extent, NASSCO is disposed to further entrench SP by building capacities of target stakeholders as well as create enabling environment for the involvement of academic field in various institutions. To achieve this, it will require enormous collaborative efforts and successful leadership from the Nigerian Government, agencies, and other partners.

### **3. Targeting of Poor and Vulnerable Households for Social Protection Programs in Nigeria**

Targeting is a means of increasing program efficiency by increasing the benefit that the poor can get within a fixed program budget. The case for targeting is relatively simple - imagine an economy with 100 million people, 30million of whom are poor. The budget for a transfer program is \$300 million. With no targeting, the program could give everyone in the population \$3. If the program could be targeted only to the poor, it could give each poor person \$10 and spend the full budget, or it could continue to give each poor person \$3 for a budget of only \$90 million. Although, targeting itself, particularly for development programmes, can be influenced by external constraints, such as power dynamics, high cost of administration, security considerations, political interference, and limited time; and if the targeting process is not

properly implemented, it may become ambiguous to recipients. Nevertheless, considering the population and cultural dynamics in a society like Nigeria, where previous programmes have been politicized, targeting brings some efficiency to an ethically generated list of poor and vulnerable households and a programme approach that is backed by scientific evidence, given the dearth of resources.

Targeting methods all have the same goal - to identify which households correctly and efficiently are poor or which are not. More generally, the motivation for targeting arises from the following three features of the policy environment:

- i. **Objective:** the desire to maximize the reduction in poverty or, more generally, the increase in social welfare/shared prosperity.
- ii. **Budget constraint:** a limited poverty alleviation budget; and
- iii. **Opportunity cost:** the trade-off between the number of beneficiaries covered by the intervention and the level of transfers.

Currently, NASSP uses a hybrid of targeting methods to determine the eligibility of households for social interventions. First, a geographical targeting, also otherwise referred to as “poverty mapping”, used to identify and select the poorest Local Governments (LGAs) in the state. This involves using existing ground classifications on the poverty situation across states to define poverty incidence and provide the basis for the classification, ranking, and selection of participating LGAs based on their poverty status. It is to be understood, however, that the targeting approach is just meant to prioritize the start point for the registration of poor and vulnerable people across the country, nonetheless, the programme principle is to achieve saturation in the registration of all eligible people across communities, wards, and local government areas.

The second is the community-based targeting approach, which uses community members to prepare a preliminary list of extremely poor and vulnerable households within their communities, who can be potentially eligible for social interventions. While this place a lot of power in the hands of ‘community members’ who may or may not act in the interests of all in poverty, especially people considered non-indigenous to the locality, or other minority groups that may not be considered, the community engagement process creates a check by breaking the community into homogenous groups of men, women, youths, and minority or other special groups to avoid potential exclusion errors. In addition, potential errors of omission are further minimized by providing opportunity for grievance redress, through either the community grievance redress persons or through the grievance redress mechanism of the programme, where eligible people

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omitted could present their case directly to the program for review from the community level right to the national level, the same mechanism is used for whistle blowing to correct errors, fraud, and corruption.

The third approach at the point of programming and extraction of the list of beneficiaries is the proxy means test (PMT), which is applied to households in the preliminary list to verify their eligibility for interventions. The PMT is generated for actual household welfare through observable household and individual characteristics such as the location and quality of the household's dwelling, its ownership of durable goods, economic assets, its demographic structure, and the education and occupations of its adult members.

This combination of targeting tools aims to ensure that interventions are targeted only at the poorest communities, uses community knowledge to reach the poorest households within the selected communities to minimize exclusion errors, and verify selection of beneficiaries at the household level using a PMT to minimize inclusion errors.

### **4. The National Social Register (NSR)**

“Social Registries are information systems that support outreach, intake, registration, and determination of potential eligibility for one or more social programs”. They have both a social policy role, as inclusion systems, and an operational role, as information systems. They provide a “gateway” for potential inclusion of intended populations into social programs.

The National Social Register (NSR) targets Nigeria's poor and vulnerable population and is part of the Government's national social protection strategy focused on poverty eradication to identify poor populations, their needs and centralize information/database. The social register is the main tool used by Nigeria to select poor families for provision of social services. It collects details, which can be used by various social programs to lift people out of poverty and to improve human dignity.

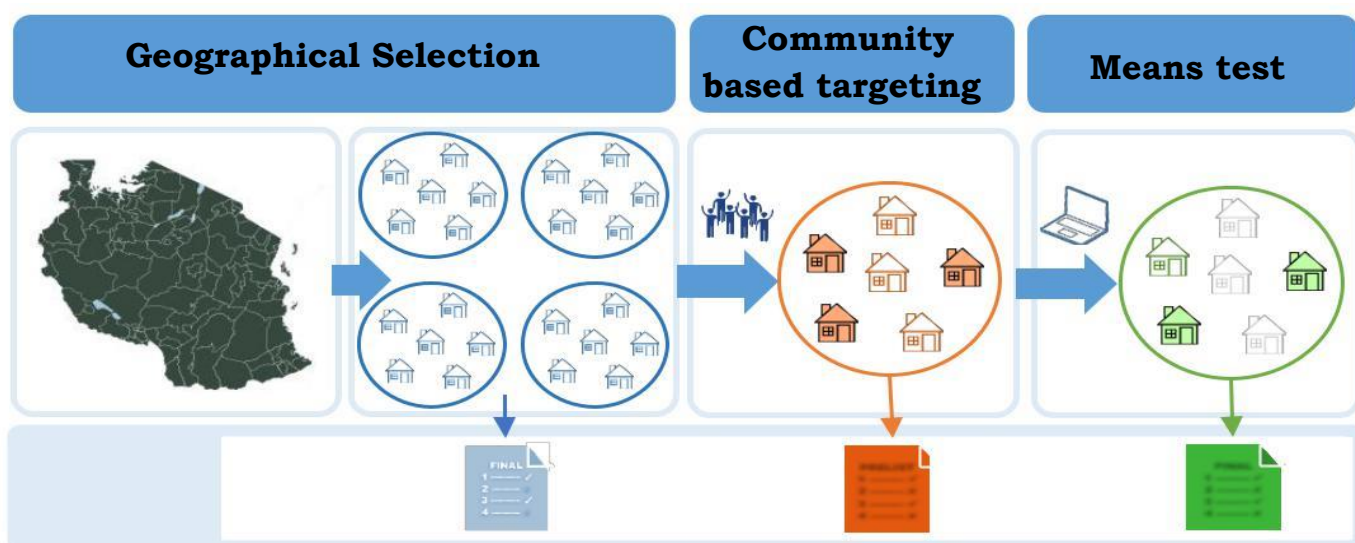
As earlier stated, Nigeria adopted four targeting mechanism namely; geographic targeting, community ranking, community-based targeting and proxy means testing to identify the poor and vulnerable households (PVHHs).

- Geographic targeting: - using a poverty map across States to provide a basis for the classification, ranking and selection of participating LGAs.

- Community Ranking is the process that relatively places communities in an order by nature of their poverty incidence, to ensure transparency in reaching out to the most vulnerable communities.
- Community Based Targeting: - Allows the community to use their subject knowledge of poverty and vulnerability to identify, validate and select households that are deemed fit to be poor and vulnerable.
- Proxy Mean Test: - allows ranking of households based on pre-determined criteria from the poor to the poorest for targeted interventions. This combination of targeting tools aims to ensure that interventions are targeted only at the poorest communities, uses community knowledge to reach the poorest households within the selected communities to minimize exclusion errors, and verify selection of beneficiaries at the household level using a PMT to minimize inclusion errors.

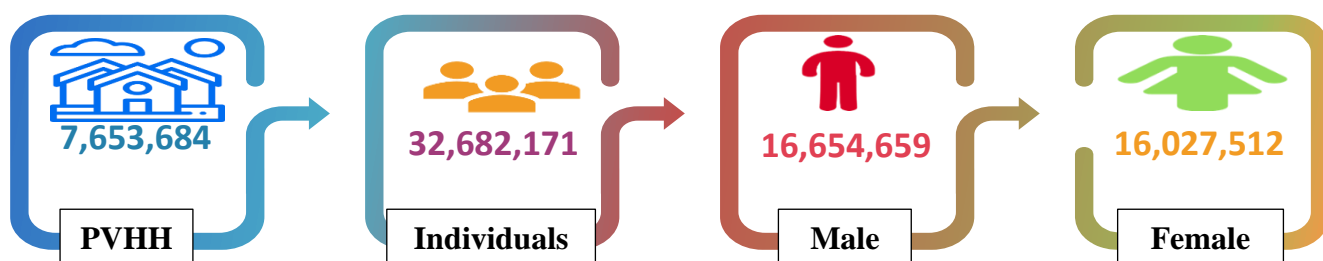
## **5. The Rapid Response Register**

As part of the effort to scale up the National Social Safety-Nets Program (NASSP) and the need to rapidly cushion the effect of the COVID-19 pandemic and ensure standard livelihood of lifting 100 million Nigerians out of poverty in 10 years as envisioned by President Muhammadu Buhari in 2019 during his inaugural speech, The Federal Ministry of Humanitarian Affairs, Social Development and Disaster Management in collaboration with the World Bank have initiated and designed the RAPID RESPONSE REGISTER (RRR).



**Figure 2: Targeting Mechanism**

As at March 2021, the NSR has a total of 7,653,684 PVHHs, out of which 61% male are heads of household while 39% are female heads of households. The households translate into 32,682,171 individuals (49% male and 51%female). On the average, statistics available from the NSR shows that household size for the PVHHs is 4.8 persons.



**Figure 3: Disaggregation of the NSR as of March 2021**

The Rapid Response Register aims to urgently identify, and capture excluded groups, made vulnerable by the economic impact arising from the COVID-19 pandemic and to **establish a shock responsive framework for accessibility and intervention of poor and vulnerable households in Nigeria during emergencies such as pandemics, flood, economic downturn and other natural and manmade**

**disasters that may be beyond the immediate control of the Federal and State Government laydown structures.** The specific objectives are;

- To carry out an online payment to 3 Million Poor and Vulnerable Households as an intervention to cushion the effect of COVID-19 pandemic
- To utilize satellite remote sensing technology, machine learning algorithm and big data analysis for targeting poor and vulnerable settlements in urban poor wards for interventions
- To utilize the TELCOS (Telecommunication Companies) digital platform for application of potential beneficiaries with field validation and enumeration for the purpose of social protection interventions

The Target areas of the Rapid Response Register is focused mainly in the Urban Poor wards selected using scientific validated methods of satellite Remote Sensing Technology, machine learning algorithm and big data analysis, which provided the basic platform for ranking the wards according to their respective poverty index and the availability of resources.

The machine learning algorithms that produce these maps accurately “learn” the hallmark patterns of wealth and poverty that are visible in overhead satellite images as well as other “Big Data” sources. This includes characteristics like the material that roofs are made from, nighttime lights, the size of farm plots, and the quality of roads. The machine-learning algorithms were trained using geo-coded “ground truth” data on household wealth from the 2018 Demographic and Health Survey (DHS). Thus, the generated satellite map provide a perspective on wealth and poverty that is much more fine-grained than could be achieved using traditional data alone.

The estimated poverty and wealth perspectives emanating from this machine learning approach are found to be strongly correlated with estimated poverty and wealth coming from the 2018/19 NLSS. The NLSS dataset was used as an independent validity test for the accuracy of the satellite imagery. To this extent this “Big Data” based poverty maps provided consistent rankings of poverty at the state level. Using the satellite imagery – and “Big Data” – based estimates in conjunction with official ward-level rural-urban classifications, makes it easy to categorize and rank urban wards based on their level of poverty (from the poor to the poorest). By using estimates of population constructed from a combination of satellite imagery and other data sources, a simulation is made on how to target support to the poorest urban wards, based on the complete ranking of the wards, and each ward’s population estimate.

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Similar to the geographic targeting and poverty mapping exercise, the process of identification for the rapid response register, uses phone-based technology infrastructure. Unstructured Supplementary Service Data (USSD) code is transmitted through the telecommunication service phone towers (masts) in each community to allow self-registration and enrollment of beneficiaries, which is then matched against cell phone data to confirm the profile of individuals targeted for the program – this process uses location-based targeting (Ward level); location specific phone information to identify and invite individual subscribers who live in the areas prioritized for the support to self-register by responding to a mass text sent out to residents of the delineated areas preselected for the program support who fulfil the required criteria (poor and vulnerable and can be identified through phone data profile) – phone ownership and density in urban ward is almost universal. The project is nonetheless mindful of potential threats of fraud through repeated registration or multiple registration by other means, as such the systems has built adequate safeguard measure including firewall, mitigating strategies as well as in-person enumeration of potential beneficiaries through home-visit, post-registration back-check of registered beneficiaries, capture and use geo-coordinates as part of the unique identity of beneficiaries as well as to track and trace beneficiary location.

### **Proposed Steps for the targeting of the potential beneficiaries**

- Selection of the priority wards for assistance
- Prepare a detailed targeting and rollout plan (communication, team mobilization, logistics, training, implementation timeline, etc.)
- Sensitization and community awareness at each Ward level, and with concerned state and local government authorities.
- Telecommunication companies will be used to identify subscribers whose “home location” is in the priority-targeted areas (Wards)
- Agreement on the content of the Mass SMS to be sent out, including the purpose, criteria for eligibility, notification of location for registration and the calendar for registration etc.
- Telecommunication companies (TELCOS) send SMS messages asking if the subscriber wants to participate. The subscribers who would like to register can respond dialing short code sent through the text.

Special arrangement for categorical targeting of eligible beneficiaries is made to identify people with special needs and marginalized groups who may be challenged or not have access to cell phone SMS messages (using CSOs, database for social groups and CBOs, etc.) through the



registration of beneficiaries who use the project grievance redress mechanism to lay their complaints, registration of populations in disability camps, etc. We also have a separate mechanism for identification and registration of internally displaced person camps in fragile/conflict affected areas like the north-west and north-east of Nigeria

Once the registration is completed, the database is subjected to proxy means test (PMT) to as a rule prioritise the poorest households. As necessary, the final list of the selected beneficiaries will be posted in community identified public places for the purpose of transparency, and complaints that may arise can be handled through the grievance management procedure of the program.

At the completion of the exercise, about 20,196,650 population in 1,181 urban poor wards out of 2651 urban wards across the country in the first instance of the intervention has been established as the sample frame. This is to be followed by digital identification using the Unstructured Supplementary Service Data (USSD) link of TELCOS facility by dialing a unique code to access the application portal. The identification exercise will also be followed by validation, enumeration and subsequent payment.

The pilot phase of the Rapid Response Register has been completed in FCT and Lagos in January 2021 with a record success of 95% and the learnings from the result of the exercise have been tangible with the view of tremendously improving the full scale up of the Rapid Response Register.

It is noteworthy to mention that this social protection method of targeting is the first strategy developed and tested in the sub-Saharan African region and Nigeria will be the first country for the implementation with flag off ceremony of the Vice President of the Federal Republic Nigeria on 19<sup>th</sup> January 2021. Furthermore, the framework for the Rapid Response Register will serve as a sustainable tool for the rapid deployment and scale up of the Nation's Social Protection program and interventions.

## **6. Why is Nigeria Investing in Building a Single Register of Poor and Vulnerable Households?**

Many programmes offer a myriad of social benefits and services to meet the diverse needs of poor people. Many of these benefits and services involve Social Protection and Labour (SPL) programs, which provide buffer to the poor against shocks. It also equips them to improve their

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livelihoods and create opportunities to build a better life for themselves and their families.

In this context, a key question is “how?” How and where do people register for potential inclusion in these programs? How is eligibility determined? How do programs make enrolment decisions? How are benefits channelled to beneficiaries? How are services provided? These are all critical implementation phases for social programs, with citizens, institutions, and information systems interacting all along that delivery chain.

The Social Register targets Nigeria’s poor and vulnerable population and is part of the Government’s national social protection strategy focused on poverty eradication to identify poor populations and their needs and centralize information. The social register is the main tool used by Nigeria to select poor families and include them in social programs. It collects details, which can be used by various existing social programs to improve the lives of poor population.

Single Registry does not manage social programs but is restricted to identifying the potential beneficiaries. From a development perspective, the social registry could be used as the reference registry for the whole social protection system (including contributory schemes) in the country.

The collection and compilation of data on Nigeria’s poor and vulnerable population will enable local governments and policymakers to develop a better understanding of this population and develop appropriate and coordinated programmes. The installation of a single registry for these population will increase social assistance programme outreach and mitigated the risks of data manipulation, fraud, and clientelism. Progressive adjustments and improvements to the single registry will allow for better transparency and traceability of the social protection system, notably through online access and automatic controls with other existing administrative databases.

### **7. Challenges**

The combination of targeting mechanisms used by Nigeria aims to ensure that interventions are targeted only at the poorest communities, using community knowledge to reach the poorest households within the selected communities, to minimize exclusion errors; and verify selection of beneficiaries at the household level using PMT. One of the main challenges identified, however, in this project has to do with tackling

the errors of inclusion and exclusion; especially now that community members could link the community-based targeting exercise with the ongoing National Cash Transfer.

## **8. Conclusion**

The collection and compilation of data on Nigeria's poor and vulnerable population will enable local governments and policymakers to develop a better understanding of this population and direct programmes and resources appropriately. The development of a single registry for these population sub-group will increase social assistance programme outreach and mitigate the risks of data manipulation, fraud, and clientelism. Progressive adjustments and improvements to the single registry will allow for better transparency and traceability of the social protection system, notably through online access and automatic controls with other existing administrative databases.

In spite of the teething challenges, the NSR in Nigeria has become a reality. Ministries, Department and Agencies (MDA), State governments, Development partners and international donor agencies have demonstrated high level of confidence by mining from the NSR for various interventions.

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# **The statistics of pupil segregation in England**

**Sean Demack**

## **Abstract**

In the context of the 2020 exam 'debacle', this paper examines two statistical 'icebergs' that measure aspects of between-school and within-school variance in the English education system; participation in private education and the 'the school effect'. These are 'icebergs' because they both display a superficial appearance of being relatively small but both have hidden, socially divisive, depths. The historical obsession with pupil segregation in England is discussed with reference to the disgraced psychologist Cyril Burt and more recent policy makers enthralled by eugenicist beliefs. In terms of private schools, between 40 and 50% of pupils from families with greatest economic and cultural capital are shown to be privately educated compared with an overall average of 7%. In terms of the school effect, a majority of variance in pupil attainment is shown to reside at the structural level of school and (more importantly) classroom levels. In other words, the English education system is socially engineered so that grades are more determined by structural location than the efforts or agency of pupils or teachers. The analyses lead into a discussion of between-school and within-school pupil segregation. Finally, the paper calls for a new post-Covid 'Spirit' to de-engineer the system to unleash the talent, ability and potential of pupils, students and teachers.

## **Introduction**

In the summer of 2020, following the arrival of Covid19 and resulting cancellation of pupil examinations, statistical methods were used to generate a 'credible' distribution of educational success in England. This became known as the 2020 exam 'debacle' (Quinn, 2020). Pupil GCSE and A level grades were (initially) based on algorithm and teacher assessments rather than the usual examination ordeal. Following weeks of outcry, the algorithm was scrapped and pupils were regraded based solely on teacher assessment. The PM shirked blame by denouncing the "mutant algorithm" (Coughlan, 2020). The result was grade inflation that the algorithm had purportedly aimed to limit<sup>1</sup>.

When grades stem from an examination, concern from pupils, students and parents for equity are commonly pacified by a belief in examination fairness. This, of course, is a perception that focuses very heavily on a small part (or process) within a larger system that spans many years. Throughout the years in the English system, layers of pupil segregation between and within schools determine the path a pupil takes to examination. This social engineering is commonly eclipsed by an examination hysteria that emphasises individual 'intelligence + effort' to help the successful student to construct a belief that their success was solely merit-based. However, the 'meritocracy' in today's England is more aligned to the dystopia penned by Michael Young (1958) than it is with naïve belief in educational equity and maximising the potential for all. Any guilt glitches in the matrix of the more liberal elite are patched with certificates of attainment (symbolic capital). Any remaining 'rebel shame' for the decisions of parents to private school are replaced with 'common sense' notions of educational quality and standards and, perhaps most gallingly of all, social duty and responsibility<sup>ii</sup>. The discourse around the 2020 debacle seems to have missed the point - statistical methods merely replicated the usual. The saga certainly provided numerous platforms for leaders to demonstrate how little empathy or common experience they have with the people they rule over. The overbearing superiority of England's leaders is to be expected given how their success and confidence is engineered by the education system. Whether summer 2020 has resulted in a growth in critical awareness of teachers, pupils, students and parents about the confidence trick performed by GCSE and A level examinations each year remains to be seen.

In England, using statistical methods to ensure a credible distribution of grades across the country would always result lead to inequity; because the construction (and justification) of inequity is a key purpose of the English education system. As the functionalists might say, education is to prepare citizens to fit the needs of society (Durkheim, 1898). Businesses require a workforce that is flexible, compliant and shy from the pursuit of organisation or autonomy; and the English education system serves this functional demand very well<sup>iii</sup>. When society discriminates through examination performance, the successful can draw comfort that their rewards are justified and reflect individual intelligence, aptitude and effort. When this performance has been created through a statistical algorithm this (naïve) bubble is burst. Examinations are pragmatic and bring administrative/legitimising advantages such as greater confidence that what is marked has actually been undertaken by the student, but have always been a very poor way of assessing understanding and application for most school subjects (except

perhaps some aspects of maths). The imperfect nature of exams is noted by the RSS Education Policy Advisory Group (EPAG) in one of their communications to Ofqual offering help and advice (RSS EPAG, 2020) in the months leading up to the debacle.

It seems particularly problematic to allow grade inflation in the private sector but algorithmically nobble the public sector given that a good grade from a state school seems to be a stronger indicator of degree success than the same grades obtained through private schools (Smith & Naylor, 2001 & 2005; HEFCE 2003; 2005& 2014; Schwartz, 2004). State school pupils have to work harder and perhaps more independently to get their grades and this seems to make them better prepared for the HE experience ahead. This has led some Universities to offer places to state school pupils at a lower UCAS tariff to places offered to private school pupils<sup>iv</sup> (UCAS, 2018). This is essentially a statistical approach to try to correct for one of many social corruptions of the English education system leading up to HE. If grades from private schools are worth less than equivalent grades in state schools, the decision to protect/inflate the private and nobble the public is statistically topsyturvy!<sup>v</sup> Amongst graduates at Oxford in 2006, Ogg et al. (2009) found that the weaker relationship between A level attainment and degree success for privately educated pupils compared with their state educated peers resided within the school rather than the student. When an aptitude test was used to measure prior-attainment, Ogg et al., (ibid) found no difference in degree success and conclude that "teaching effects, associated with private school students, distort secondary school grades as an indicator of academic potential in higher education when compared to state school students" (Ogg et al., 2009 abstract). In other words, private schools are good at getting the grades but seemingly at the expense of the learning (otherwise known as hot-housing).

The elite draw on their educational success to justify high levels of capital. The education system provides symbolic capital to justify economic wealth, power, influence, multiple houses, environmental vandalism and social superiority. In return, the private sector receives around one third of educational funding to hot-house their 7% of pupils (OECD, 2019 p292). Symbiotically engineered for a win-win for them, and to nurture geniuses for all. This justification is embedded in eugenicist thinking that has perennially fascinated the political right. Through rhetoric honed in debating clubs, a belief in the educational superiority of pupils/students who exert no effort while gliding through the 'rigorous' trial by examination is perpetuated<sup>vi</sup>. In England, opinion confidently expressed from some mouths can cloud and undermine empirical evidence. This is perhaps to be expected in the land of the two cultures (Snow, 1959).

This paper discusses two aspects of the English education system from a statistical perspective. Two statistical 'icebergs' are considered; first the 7% of pupils educated privately<sup>vii</sup> and second, 'the school effect' as measured by the proportion of attainment data clustered at the school level (commonly estimated at between 10 and 20%<sup>viii</sup>).

Segregation is socially engineered into the English education system; like Blackpool rock. This is most clearly seen with the public / private school divide where individual / market freedom is seen to be more important than the needs of wider society. Other than individual freedom, the continued acceptance that it is reasonable to allow money to purchase educational advantage is justified by both trivialising and emphasising societal impact. The trivial line of argument points to the very small proportion of pupils located in private schools: 7%. How can such a small proportion undermine the whole educational structure? Whilst being too small to damage society, private schools provide a closed world in which the precious gene pool of the elite can be preserved for the 'benefit' of society. This draws on eugenicist beliefs in innate intelligence and genetics. Allowing families that have (often over generations) accrued 'quality' genes of intelligence to purchase educational advantage not attainable to others is a creative circumnavigation of any concerns about equity. In response to this, I refer to the words of Sheffield city treasure, Jarvis:

"Did you hear? There's a natural order  
Those most deserving will end up with the most  
That the cream cannot help but always rise up to the top  
Well I say, "Shit floats" (Cocker, 2006)

### **Private Education**

So, with such a small proportion of parents able to purchase educational advantage for their children it seems dogmatic to consider binning this system. However, the 7% is an average figure across the whole pupil population regardless of the presence of capital or desire to purchase advantage. When capital is taken into account, a different story emerges; where between 40 and 50% pupils from the 2% of households with the highest concentrations of capital are privately educated.

The relationship between socioeconomic background and education has become less clear in England in recent years because of decline in measurement validity that arrived with an increased reliance upon



administrative data. In the last couple of decades of the 20<sup>th</sup> century, social surveys such as the Youth Cohort Study (Croxford, 2004) were the main quantitative data sources used to help explore this. Social surveys are hampered by statistical problems such as non-response and the potential bias this brings and so the arrival of administrative data in the 21<sup>st</sup> century collected directly from schools brought hope of better evidence and (therefore) understanding. The National Pupil Database (NPD) is THE key educational data source for pupils / students aged between the ages of 5 (Reception, Early Years Foundation or YO) and 18 (Key Stage 5 / A levels) but does not include a valid measure of pupil socioeconomic background. Two 'proxy' measures are found on the data file; Free School Meals (FSM) and geographical deprivation indices (most commonly the Income Deprivation Affecting Children Index; IDACI). A detailed critique of the problems of these measures is beyond the scope of this paper but the problems of using FSM are (superficially) acknowledged in an Educational Select Committee (GREAT BRITAIN, Parliament, House of Commons, 2014) and a more statistical examination is found in Halse and Ledger (2007) and Taylor (2018). In summary, FSM is a binary measure used to statistically examine the educational performance of a problematic educationally vulnerable / disadvantaged group. At the same time, FSM serves to hide the educational performance of the educationally advantaged. Pupils with double-professional parents are grouped with pupils with parents in low paid occupations and/or pupils who qualify for FSM but do not claim it because of issues of social stigma (more common for poor pupils in affluent areas, see Iniesta-Martinez & Evans, 2012).

Alternatives to the binary FSM measure are socio-geographic proxies of socioeconomic background. Unless England was perfectly ghettoised along lines of capital, the use of socio-geographic measures of deprivation like IDACI brings ecological problems. Poor pupils do live in wealthy areas (where they are less likely to claim Free School Meals) and rich pupils do live in poor areas. IDACI along with IMD and POLAR are blind to such realities and assume affluent area = affluent pupil/student (and vice versa). A seeming lack of interest/concern in methodological validity and statistical accuracy has led to the dominant use of socio-geographic measures in exploring socioeconomics and access/attainment/progression in higher education in England. Then again, perhaps it is of keen concern for some to maintain poor statistical practice to ensure that analyses are persistently plagued with problems that are useful to highlight when findings are politically off message.

An added barrier to the exploration of the relationship between socioeconomic status and educational success arrived in the wake of the General Data Protection Regulation (GDPR) with the notable clampdown on

access to public data in England (Harron et al., 2017; Demack, 2019). Access to NPD data is now severely restricted, all tables are assessed by ONS and all interpretations of tables are also assessed in a prolonged two stage process. Additionally, analyses are undertaken in a controlled room and under surveillance. Prior to the enforcement of such draconian working conditions, there was a time with easy access to a seminal educational survey; the first Longitudinal Study of Young People in England (LSYPE<sup>ix</sup>). A second LSYPE is currently being undertaken but access to (key parts of) this data are restricted. The data clampdown impacted on the LSYPE because of the inclusion of NPD data alongside survey data; in order to access this NPD data for the LSYPE respondents, a researcher faces excessive administrative hoops that are clearly easier to navigate for some (e.g. academics with administrative support, the well-resourced) than for others (anyone without such support; the public; the less well-resourced). This inevitably will reduce the quantity of critical analyses undertaken using this data - a shame, GDPR or perhaps a plan coming together. Prior to the clampdown on LSYPE data, I worked on a number of projects that used the LSYPE 1 data (Demack et al., 2010 & 2012). Amongst these was an examination of the relationship between socioeconomic background and participation in private education. Using the accessible parts of LSYPE 2 data, the association between ‘capital’ and participation in private education can be examined for two pupil cohorts. The LSYPE 1 cohort examines private school participation for a cohort of pupils at the end of key stage 4 (Y11, age 16) pupils in 2006; LSYPE 2 cohort does so for a cohort of pupils at the start of key stage 4 (Y9, age 14) in 2013. Table 1 provides a summary of the percentage of pupils located in private schools in 2006 and 2013.

**Table 1: Percentage of KS4 pupils located in private schools by socioeconomic background, 2006 & 2013.**

	<b>LSYPE 1, Wave 3 2006 (End of KS4)</b> Y11 (age 15/16) Weighted N=12,439	<b>LSYPE 2, Wave 1 2013 (Start of KS4)</b> Y9 (age 13/14) Weighted N=13,100
<b>All respondents</b>	7.2% (n=894)	7.0% (919)
<b>HE Grandparent</b>	19.8%	-
<b>Undergrad parent</b>	21.9%	16.5%
<b>Postgrad parent</b>	27.1%	-

<b>NS-SEC high prof/manag</b>	20.9%	18.4%
<b>HH Income £52K+</b>	25.9%	-
<b>1+ Parent income £50K+</b>	-	29.9%
<b>1+ Parent income £40K+</b>	-	23.5%
<b>1+ Parent income £30K+</b>	-	15.1%
<b>Combined Capital</b>		
<b>HE grandparent &amp; graduate parent</b>	31.0%	-
<b>NS-SEC high prof &amp; HH Income £52K+</b>	30.9%	-
<b>NS-SEC high prof &amp; parent Income £50K+</b>	-	34.9%
<b>HE grandparent &amp; graduate parent &amp; NS-SEC high prof &amp; HH Income £52K+</b>	50.7%	-
<b>Graduate parent &amp; NS-SEC high prof &amp; parent Income £50K+</b>	-	37.8%

**Sources:**

LSYPE 1 (see [Welcome to Interactive LSYPE \(sda-ltd.com\)](http://www.sda-ltd.com) )

LSYPE 2 ([Longitudinal Survey of Young People in England: Cohort 2 - CLOSER](#))

Overall, 7% of respondents were located in private schools in both 2006 and 2013 but, as might be anticipated, there is notable socioeconomic variation in participation and this can only be viewed when using variables other than FSM<sup>\*</sup>.

In addition to different pupil year groups (Y11 & Y9), there are a few differences between socioeconomic variables for LSYPE 1 and 2. In terms of cultural capital, both have detail on whether one or more parent of a respondent had an undergraduate degree but LSYPE 1 has additional detail on HE experience of grandparents and whether a parent held a postgraduate degree. In terms of economic capital, both have a comparable household occupational NS-SEC measure but estimated income differs. LSYPE 1 has a categorised household income estimates; LSYPE 2 has categorised income estimates for individual parent(s).

In terms of cultural capital, having a parent with an undergraduate degree is associated with higher participation in private education in 2006 (22%) and 2013 (17%). The additional detail in 2006 shows

participation to be higher still when a parent had a postgraduate degree (27%) and an association with having one or more grandparent with HE experience (20%).

In terms of economic capital, having a parent who is employed in an occupation classed as NS-SEC high professional / managerial is associated with higher participation in private education in 2006 (21%) and 2013 (18%). In 2006, having a household income in the highest band (£52K+) was associated with higher participation in private education (26%). In 2013, a similar pattern is seen when one or more parent had an income of £50K+ (30%); an income of £40K+ (24%) or an income of £30K+ (15%).

These dimensions of capital do not exist in isolation of each other. For example, in 2006, of the 14% of respondents with 1+ parent in a high professional/managerial occupation, over half also had a parent with a degree and/or a household income of £52K+. In 2013, of the 16% of respondents with 1+ parent in a high professional/managerial occupation, two thirds also had a parent with a degree.

If the dimensions are intersected, Table 1 shows that, in 2006, the private school participation rate was 31% for pupils in households with a parent with a degree or higher and a grandparent with HE experience and 50% for pupils in households with a parent with a degree or higher; a parent in a high prof/managerial occupation; a grandparent with HE experience and an estimated household income of £52K or higher. In 2013, Table 1 shows that the private school participation rate was 38% for pupils in households with 1+ parent in a high prof/managerial occupation and 1+ parent with an income of £50K+.

In summary, the 7% iceberg figure hides a reality where 40-50% of pupils with the greatest (top 2%) economic and cultural capital are educated in private schools. This is a statistical illustration of how socially privileged parents appreciate the educational advantage purchased through private education. 4-5 of every 10 pupils from the most socio-economically advantaged households are systematically segregated from 93% of their peers. By definition, this is divisive, but a liberal view might highlight examples of great artists, scientists, engineers or architects that have emerged from the segregated system. The distraction of individual greatness helps to white-wash structural realities. Superhuman myths are key part of the meritocratic lie and inherently drenched with racism and chauvinism (Dorling, 2015). In other words, 'great' white male artists, scientists, engineers and architects have been

munching at a 'genius' cherry systemically placed out of reach for most men and all women for most of modern history. As racism and sexism were key in the construction of past genii, it is perhaps unsurprising when an anointed genius expresses views within these frameworks. For example, James Watson (hoped that everyone was equal, but "people who have to deal with black employees find this not true") and Francis Crick (positive eugenics) (both and others in Dorling, 2015). In addition to providing white male genii, the system must produce people (again, mainly white men) with a thirst for a form of office who will flow towards Westminster and help to politically ensure that the win-win (majority lose) system of privilege is defended and maintained.

As touched on earlier, this statistical evidence has limitations because the data stems from two social surveys with associated issues of response and sample size. However, the lack of a valid socioeconomic measure in the NPD and general reticence of the Independent school sector to subject itself to statistical scrutiny mean that this is a rare look at this pattern. All state schools have a legal obligation to submit details on pupil attainment, gender, ethnicity, FSM etc. but private schools have a more limited obligation and tend to submit the bare minimum (just gender and attainment). The FSM measure is likely to have little/no meaning in private schools but the lack of ethnicity detail makes examination of experiences of ethnic differences in the private sector impossible; an example where commercial sensitivity seems to be prioritised over concern about protected characteristics. I understand that a separate data set is collected by independent schools and this does include ethnicity data but for some reason, this is not included in their submission to the NPD.

The remaining 93% of secondary pupils are educated in mainstream state schools, special schools, pupil referral units or at home. Within mainstream state schools (often confusingly called 'comprehensive' schools), segregation remains nearly universal. This current reality is a product of the history of the English education system from the introduction of universal secondary education in the post-WW2 social settlement; the spirit of 1945. Education for all was provided following four centuries of Britain / England enjoying international economic dominance from the brutality and theft of Empire. This echoed a post-war expansion of mass education across the global north. In England, the initial post-45 years focused on constructing a system based on segregation between schools with the incorporation of some ancient Grammar schools into the state system. A small sample of pupils were selected into Grammars based on performance in the 11-plus examination and the 'failed' majority were sent to secondary modern schools. This political process was justified through the work of the first

psychologist to become a Knight of the British Empire; Sir Cyril Burt. This reward was in acknowledgement of the influence of Burt in shaping the education system, particularly following the Second World War (for example, Burt, 1909; 1920; 1943; 1958; 1959). Burt's perspective was saturated with the eugenicist beliefs / theories that were held in high regard by the regime that Britain had helped to defeat in that war. The immediate post war years saw political consensus in constructing an education system around these perspectives but voices of dissent began to surface (Floud et al., 1956; Halsey, 1958). Confronted by critical sociologists with empirical evidence that Sir Cyril seemed unable to empirically challenge, he retreated into ideology and scandal. After the death of Sir Cyril, it became apparent that he had made up his data and fabricated analyses, participants, and co-authors (Tucker, 1997).

The corruption of Sir Cyril may have helped to push the theories of educational eugenicists to the periphery of overt influence on educational policy but a more covert 'IQism' remains (Dorling, 2015). Hidden for a while, glimpses have been caught from the US in *Bell Curve* in the 1990s (Hermstein & Murray, 1994) and more recently in the UK with the 2017 UCL eugenics conference<sup>xi</sup> and Michael Gove / Dominic Cummings attraction to the work of Robert Plomin<sup>xii</sup> and official 'weirdo' super forecaster, Andrew Sabisky<sup>xiii</sup>. In the immediate post-war years, eugenicist beliefs were widespread and used to justify segregating most poor pupils from their intellectual superiors (Hanson, 2013). Some poor pupils did get into the Grammar system and some of these went on to university and onto socioeconomic comfort. At the individual level, upward social mobility was experienced, and these individual experiences provided tokenistic evidence of success for the educational system in helping to slay Beveridge's giants (Beveridge 1942).

Of course, using individual data as evidence of success/failure at a system/structural level is an example of a failure of reasoning known as the atomistic fallacy or fallacy of composition (Vogt & Johnson, 2011). This fallacy is the complement to the ecological fallacy of assuming group level patterns are true at the individual level (see IDACI above). Following growing pressure from parents, circular 10/65 issued by Anthony Crossland was the starting point in a failed attempt to "destroy every fucking grammar school in England" (Crossland, 1982, p148). The circular 'requested' Local Education Authorities to submit plans to replace the two-tiered system with a single tiered 'comprehensive' system. The fear of a truly comprehensive system brought numerous academic and political attacks from eugenicists and the political right (Cox & Dyson, 1971) based on confident opinion and anecdote rather

than robust evidence (unless you count that made up by Sir Cyril). Even with these desperate measures from the right, the move away from Grammar/secondary modern and towards comprehensive schools gathered pace in the 1970s with the number of Grammar schools falling from over 1,000 in 1970 to 566 in 1975 and to just over 200 by the time Margaret Thatcher became prime minister in 1979. Thatcher halted the move from the grammar/secondary modern to comprehensive schools leaving a mixed education system with some LEAs with comprehensive state schools, others maintaining the older grammar/secondary modern system and others with a mixture of the two (which is effectively a rebooting of the older system).

Alongside this, of course, is the continued existence of private schools. Through many helpful political interventions (e.g. assisted places), private education has gone from strength to strength. In LEAs where pupils still suffer Sir Cyril's eugenicist system (like Kent and Trafford), the private sector acts as a safety net should the 11+ not be surmounted. Parents with capital invest (via tuition) to try to access 'free' socially segregated state education with private school as the more expensive plan b. This is parents doing what parents will always do; what they perceive to be 'best' for their child(ren). The problem is that what is best for the offspring of the elite tends to run counter to what is best for society. The system markets itself to the individualistic/family desires of the elite because it was socially engineered and re-engineered for them. A system engineered for the elite shines brightly for the aspirational middle class who may need to 'do without' in their 'struggles' to purchase educational advantage. Those with capital are encouraged to use it to best ensure this capital remains in their lineage; and the Grammar / private school systems are engineered to meet this demand.

A comprehensive system is only realised when all LEAs operate non-selective entry policies for all schools in their control and which apply to all pupils. Given such things as catchment areas and housing, such a system could only be envisaged as an aim in England. When financial or academic selection is brought into an education system it ceases to be comprehensive. The greater the influence of selective schools, the weaker the comprehensive ideal. In England, there are many schools with comprehensive labels - and perhaps historical ideals - that appear rather hypocritical today. An individual school might be given a 'comprehensive' name to highlight that no policies of academic selection are used to determine whether a pupil attends. But once a pupil crosses the secondary school gates, they usually enter a covert Grammar / secondary modern system under a comprehensive badge. The difference being a lack of transparency.

### **The School Effect**

The rise of multi-level modelling through the 1980s and 1990s provided new software and statistical tools to help explore the structural nature of the education system (Goldstein 1987). The clustering of variance for indicators of educational success (e.g. attainment) at the school level could be measured and any changes over time could be observed. In the School Effect (Smith & Tomlinson, 1989), the proportion of variance in attainment data found to cluster at the school level was between 10 and 20 percent. This meant that at least 80% of variance was within schools and commonly assumed to be between pupils. This 'school effect' figure of 20% or lower has been found on many occasions since (e.g. Allen et al, 2018). The relatively small proportion of variance found between schools (20% or less) serves to suggest that the role of schools in helping to dismantle or disrupt long standing educational inequities is limited. One fifth or less of attainment difference was between schools; so the influence of pupil-compositions and other factors on attainment is one fifth or less. However, this is a conveniently naïve understanding of the English education system. Pupils are not taught in a single block within each school; they are taught within classes within year groups. Pupils are not usually randomly assigned to their classes; this is commonly done through within-school academic selection and policies of setting and/or streaming.

Essentially, most secondary schools with 'comprehensive' policies for access operate an internal grammar *and* secondary modern school system across all subjects (streaming) or, more commonly multiple systems across specific subject areas (setting). The excessive use of within-school segregation policies have been highlighted as key barriers to social mobility in England (Causa & Johansson, 2010). In terms of attainment, little to no positive evidence for the use of setting/streaming has been found but growing evidence on the harmful impact of such policies is emerging<sup>xiv</sup>. Essentially, there is no educational justification for a school moving from all/mixed ability classes to a policy of segregating pupils through setting/streaming. The problem is that in England nearly all secondary schools already segregate and have done so for decades with others more recently being forced into doing so through the cosh of special measures and the OFSTED inspection<sup>xv</sup>. The segregation is maintained by confident argument (bluster) and fear of middle class parents (Taylor et al., 2017). The system is now awash with people with no other experience than that of segregating. The training, practice, curriculum planning and examination are within the segregated structure and culture.



Within-school statistical detail on the English education system is difficult to access; and things have not got easier since GDPR. However, involvement in designing and undertaking Randomised Controlled Trials has enabled access to this detail for a number of projects<sup>xvi</sup>. If it is assumed that 20% of variance in attainment lies between schools, this clustering of variance at the school level is known as the school level intra-class correlation coefficient (ICC). This suggests that 80% of the variance is within schools. Ignoring year groups, classes, teachers, setting/streaming policies results in the structurally naïve conclusion that the 80% is all about individual difference. Given the complexity, it is perhaps understandable that multilevel analyses would first focus at the school and perhaps LEA level. Once these are figured, the next step might be to look into the school. Indeed, in the early analyses, the importance of the classroom level was noted (Goldstein, 1997).

After designing a number of 2-level clustered RCTs, I decided to try and incorporate the teacher into the research design. The lack of a 'teacher level' in most educational RCTs seemed like a glaring omission. My initial concern was practical rather than statistical. Across evaluations, it was the teacher that usually directly experienced the 'intervention' being evaluated and commonly this was two or more teachers in a school. Alongside an educational RCT, a mixed methods 'Implementation and Process Evaluation' (IPE) is usually undertaken that collects data from teachers on a variety of things such as engagement with the intervention and any classroom tasks. Administrative data on teacher attendance of training events is also commonly drawn on. This IPE data is used to explore 'fidelity' to an intervention. Fidelity relates to whether a teacher did all that was (theorised to be) needed to best ensure that an intervention was delivered as it was intended. The inability to link teacher-level IPE data to the school / pupil level impact evaluation was frustrating and my key motivation to include a within-school level in future RCT designs. The trial where I first undertook a 3-level design was funded by the DfE (Boylan et al. 2015). Whilst the trial itself had issues related predominantly to the limited time resource the DfE specified (less than a year), the resulting data set proved to be fascinating.

In designing a clustered RCT, the partitioning of variance is an important consideration. The proportion of variance found between clusters is estimated using the Intra-Cluster Correlation coefficient (ICC). For a fixed/specified number of schools, an increase in between-school variance (as measured by the ICC) leads to a drop in statistical sensitivity. Statistical sensitivity is usually estimated using a power analysis to calculate something called a Minimum Detectable Effect Size (MDES). This is the smallest difference (often measured as an effect size such as

Cohens  $d$  or Hedges  $g$  in units of standard deviations) between the groups (control & intervention samples) that could be detected with a specified level of statistical error (e.g.  $p < 0.05$ ; statistical power  $> 80\%$ ). In addition to the clustering of attainment data, the sensitivity of a trial can be increased by covariate explanatory power and/or by increasing sample size. In terms of sample size, greater gains in sensitivity are brought by increasing the number of clusters at the higher level (e.g. schools & classrooms) rather than at lower ones (e.g. number of pupils per class or school).

The DfE-funded 3-level trial was used to evaluate a Key Stage 3 maths programme that focused on improving multiplicative reasoning for secondary school pupils aged between 11 and 14. Data was collected for pupils in the first three years of secondary education (Y7 to Y9) across 62 schools in England. The pre-randomisation design made some assumptions that seem rather naïve with hindsight. MDES estimates prior to randomisation ranged between 0.24 sds (in Y7) and 0.26 sds (Y9). This means that for the Y7 sample, the design was estimated to detect a difference of 0.24 sds in the outcome (a maths test) as statistically significant ( $p < 0.05$ ) with a statistical power of 80% or higher. A class rather than teacher level was included into the design. This was done to reflect practical complexities such as dual or shared classes and specialist teachers; a pupil is always located in their maths class but sometimes their maths teachers changed. Details on classes and teachers were collected but the design focused on the class level. It was (naively) assumed that around 5% of the variation in the outcome would be clustered at the class level (class level ICC assumed to be 0.05). The reality was rather different and the impact of this on the trial sensitivity was striking (the actual MDES resulted in being between 0.41 and 0.49 sds). In reality, class level ICC values of between 0.42 and 0.70 were observed. It is somewhat illogical to consider variation at the class level (i.e. within schools) separately from the variation between schools in which the classes vary; but the clustering does suggest that the classroom is more important than the school, but both combine to account for between 63% and 74% of variance in attainment. In other words, only between 26% and 37% of variance is at the pupil level; differences between-pupils within-classes. The school (and most strikingly, the classroom) seem to be statistically more important than was previously thought from 2-level analyses. The potential for the school, classroom and teacher to help to disrupt and dismantle long standing educational inequalities is therefore greater than previously thought. Of course - the clustering is driven by pupil segregation - the near universal use of setting/streaming of pupils in secondary maths in

England. The findings illustrate how the education structure serves to smother the potential impact teachers can have on the attainment of pupils; because the majority of difference is structurally engineered (or determined). Of course, a teacher may create an educational revolution in their classrooms. Such experiences will go unmeasured through the various examinations but may well encourage pupils to develop self-belief; confidence; creativity; respect for others, an understanding of society and a love of learning (amongst many other things). This is a plight of the secondary school teacher in the English education system; drawing professional solace in the classroom and pupil agency whilst being complicit in enforcing pupil segregation which results in limiting the academic 'impact' of their profession. Although, even the professional autonomy of teachers within their classrooms is moot in the performativity panopticon of schools today.

The 26 to 37% estimate for the proportion of variance in maths attainment that lies between pupils, once school and class clustering is accounted for, is based on a limited data set. Similar strengths of clustering have been found elsewhere (Demack, 2019) but studies are scarce. At the time of writing, I am awaiting access to NPD data for a trial involving 120 secondary schools for an evaluation of a different KS3 maths programme (Realistic Maths<sup>xvii</sup>). In addition to measuring the clustering of attainment data at the school and class levels, this trial collected data to track pupils during the first three years of secondary school (Y7 to Y9 again) to capture movement between classes (e.g. moving up/down sets or introduction of setting). However, with the arrival of Covid19, NPD access has become a more drawn-out affair!

The focus here has been on secondary maths, segregation is found in other subject areas and is also once more a common feature of primary schools<sup>xviii</sup>. Data from lessons observed by OFSTED in 2010 found segregation to be most common in maths. From the final two years of primary, maths sets become increasingly common in Y5 (26%) and Y6 (34%) and increase sharply in secondary from 62% in the first year (Y7) to 74% in the final year. Setting was also evident for English from 12% (Y5) to 19% (Y6) in primary school and 49% to 65% in secondary. Finally, setting was also popular in Science but seems more common later on from 2% to 3% in primary school and from 45% to 65% in secondary. This data was obtained to respond to a question in Parliament in 2011 (Dracup, 2014). In 2019 I submitted a freedom of information (FOI) request to OFSTED to seek more up to date data on setting/streaming in schools they inspected the response illustrates how unproblematic pupil segregation is perceived to be.

"... I can confirm that we do not hold any such analysis that meets the description of your request. As the explanation in Hansard sets out, in

response to the Parliamentary Question, Ofsted provided summary data for the period 2009-10. The data was based on lessons observed during inspections that had taken place in this period; however, the data was not an indicator at a national level. The analysis undertaken to respond to the question was a one-off piece of work and not something carried out routinely." Ofsted, 2019 via email

### **Discussion**

The construction and justification of inequity is a key purpose of the English education system. This is done with a smile and pretence of an alternate reality of educational success brought by effort and aptitude (intelligence too but this is less shouted about). Private schools segregate a privileged group of pupils from 93% of their peers and 40-50% of the 2% of with greatest economic and cultural capital choose this. It seems clear that buying academic advantage in the form of 'grades' through private education works. However, this is counter-balanced by a limited /narrow social education and a relatively lower depth of learning<sup>xix</sup> when compared with their state educated peers. This becomes of critical concern for society when individuals with such limited common experience, empathy and learning rule over the rest (as demonstrated in 'the debacle').

Meanwhile in the state sector, the 11+ realised (and still does for some) naïve meritocratic (and eugenicist) beliefs and gave many an early experience of failure to draw on in helping to explain their future social struggles. The remnants of this system conspire to energise the market for education; private schools used to catch the children of the elite who do not make the 11+ hurdle. Other than the problems brought by private education, pupils saved from the 11+ do not suffer such overt discrimination. Instead, their segregation takes place within schools commonly known as comprehensives. Pupils are tested and sorted according to measured and/or perceived ability. As with the 11+ experience, setting/streaming in 'comprehensive' schools communicates educational success and failure. Streaming is more closely aligned to the older system when pupil cohorts are divided into Grammar and Secondary Modern streams for all subjects (although these may be labelled more neutrally as part of the obfuscation). Setting does allow for some fluctuations (a pupil might be in a high maths set and low English set for example) but essentially is built on the same beliefs in measurable innate intelligence held by Sir Cyril et al. Pupils bounce off the buffers of success and failure in finding their path through and beyond secondary school. Traditional academic paths will lead to the school 6<sup>th</sup> form, A levels and HE. Less traditional paths will lead to FE college and

vocational qualifications and possibly HE. Finally, paths will lead the least successful away from education into an increasingly precarious workplace with little autonomy. The English education system does well in lowering the sights and confidence of pupils on this last pathway through years of signalled failure culminating in pointing to the door following Y11. Much time and effort is spent placating or distracting pupils from their structural position within the (pre-sixth) school; attitudes to learning are dwelled on and critical understanding of structural barriers obscured by a cloying positivity. Once shed of around 60% of their pupils, comprehensive schools with sixth forms return to the older Grammar school overtly selective system with disproportionately socially advantaged pupils.

England is a funny old place with a cranky education system not fit for a progressive 21<sup>st</sup> century. The masses finally got 'free' education 75 years ago but that was socially engineered to limit success for most and maximise it for the few. Corrupt academics were used to prop up beliefs in innate intelligence, eugenics and faith in the effortless superiority of the elite. Whilst horribly flawed, 'free' education was a seismic step for England and one that the Labour party built on in the 1960s with the Crossland circular, Open University and school public health programmes. Things came to a grinding halt in the 1970s most clearly signalled by Callaghan's Ruskin speech and the arrival of Prime Minister Thatcher. The autonomy of the teaching and education profession has been falling since then. In sum, evidence of progress in the first 30 years of free education followed by 40 years of stagnation. In this 40 year period, further obfuscation arrived in the name of a common examination system (the GCSE) to replace a 'divisive' two tiered O level / CSE system. The GCSE is common in name only because a number of (high status) subjects use tiered entry; meaning that the same two-tiered system remained - but was less overt/transparent. This period also saw the school become ever more iconised and blamed for systemically engineered failures (see 'school led system<sup>xx</sup>'). League tables of simplistic statistics were published to misinform parents about their local schools and remain a regular embarrassing feature in England (although the more enlightened systems in Scotland and Wales have moved on). Local accountability of schools was undermined by persistent attacks on Local Education Authorities' ability to properly manage a local education system from Grant Maintained Schools through the illusory Parental Choice to the Academy chains of today. Schools are encouraged to diversify and specialise; parents then to choose the school most suited for their child(ren). This marketization would be laughable if it wasn't so pernicious and has more than an aroma of the socially and culturally narrow world of the elite; what do we expect given that around half of them choose to use their capital to purchase

educational advantage (along with the sheltered segregation bolt on) for their children.

Amidst the regressive mire of education in England in the last 40 years, one notable step forward is clear: the (legal) removal of systemic violence in schools. Prior to 1982, all pupils in English schools (primary and secondary, state and private) witnessed or personally experienced the deliberate infliction of physical pain and psychological humiliation from their teachers (along with parents, police, shopkeepers and any adult who felt the desire). Today, such ritualised violent practices are considered brutal and perverse but discipline in England's schools was ensured through routine threats and violent realities; an approach famously exported in the days of Empire. 1982 saw a ruling by the European Court of Human Rights that gave parents the right to protect their children from school beatings and four years later corporal punishment in English state schools was outlawed by the UK Parliament. So, for the last 34 years, pupils in English state schools have not had a legally sanctioned fear of violence embedded into their school day. However, pupils in private schools had to wait a while longer before the threat of the cane, slipper or hand was removed. Pupil walloping was finally outlawed in all schools between 1999 and 2005. The protracted time was due to religious private schools failed attempts to maintain their 'Whack-O!' spanking habits via the legal system. This is perhaps a very rare example of state pupils being advantaged when compared with their privately educated peers. This injustice has now been removed from the whole system; a step forward and future hope for progress. Of course, 'harm' to children can manifest in many ways including physical, social and psychological. In terms of Bourdieu's symbolic capital, being placed in a low maths set (like failing the 11+) is a 'negative consecration' of educational ability/potential. This 'consecration' has scientific rather than religious roots (a pseudo-science that has faith in measurable innate intelligence). This serves as an example of the symbolic violence of pupil segregation. This may have 'helped' numerous generations to explain their future poverty and struggle. Individualising what is caused by a socially engineered system has been in vogue through the 40 years of educational stagnation in England, keep on smiling and don't play the victim card. The result is a widespread belief in a naïve meritocratic lie (Reay, 2020; Mijs & Savage, 2020).

The rigidity of the English education system reflects the social engineering of its construction that best ensures success for pupils from the right social background (and ethnicity) whilst building barriers to success for most. Segregation ensures social reproduction and is why the

rich and powerful have not and will not permit a move away from it. Justifications for the extent of covert/overt pupil segregation draw on age old and widely discredited beliefs in eugenics, innate intelligence and natural order. Rigidity and segregation also ensure mediocrity because of the socially engineered "disconnect" between the genuine holistic pupil ability and educational success. The result is hot-housing and mental health problems at the top and restricted access to curricula and grades and mental health problems for the rest (Boaler, 1997a; 1997b; Boaler et al., 2000).

Currently, capital is an obvious spanner in the wheel of naïve meritocratic belief in England; short circuiting any chance of realising the economic, cultural and social potential of all in order to ensure the same old few can hold onto comforts, power and effortless superiority. The system enables parents with capital to seek to maximise return through their children but at the expense of societal cohesion. It is as illogical and unreasonable to expect progressive change to come from parents as it would be to expect the consumer to resolve the climate crisis through purchasing power alone. This would require parents to prioritise society over what they believe to be best for their children; a level of civic trust difficult to believe possible (perhaps particularly in England).

Evidence of progress in the 40 years since Ruskin are limited to the legal removal of violence, HE expansion (offset now by mass privatisation of HE via £9K/year student fees/debt) and the (now historic) Education Maintenance Allowance. The balance of power has shifted from teachers and other educationalists to politicians, with the school taking the blame (and the glory). In a similar way to deciding whether to beat a child, the decision to segregate pupils comes from a world away from education; it is political. A political ideology with embedded beliefs in the genetic supremacy of 'the haves' over the 'have nots'.

Teachers, educationalists, unions, pupils, students, and parents need to prise power back from Westminster. A focus on cooperation over competition and on education over segregation is urgently needed. Generations of young people have been harmed by the systemic violence of segregation, whether they are educationally 'successful' or not. Teachers and educationalists have a professional duty to engage, encourage and enthral but not damage, abuse or segregate. Some hope is seen with the National Education Union independent review of GCSE and A level examinations in England<sup>xxi</sup> but this is muted by the lack of Government interest. This, of course, is to be expected. Any moves away from segregation would undermine social reproduction and this is not nor ever would be in the interests of a Tory government. This,

however, conflicts with the educational and economic interests of society which would be best served by the removal of barriers of access at all educational levels. A true comprehensive system from primary to tertiary would provide strength through diversity. Teachers and headteachers will need to adapt to a non-segregated system; to free up their profession. The post-Covid world needs a similar courage and 'Spirit' seen in 1945 if England is to realise and release the autonomy, potential and hope of pupils, students and teachers.

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### **Notes in paper:**

<sup>i</sup> In terms of attainment 8; the mean score in 2018 was 46.5; in 2019 was 46.7 (+0.2 points) and in 2020 was 50.2 (+3.5 points). In terms of the percentage attaining a grade 5 or higher in Maths and English, 43.3% in 2018; 43.2% in 2019 (-0.1 points) and 49.9% in 2020 (+6.7 points) See

<https://explore-education-statistics.service.gov.uk/find-statistics/key-stage-4-performance-revised/2019-20>

<sup>ii</sup> The social responsibility of private education; by sending their offspring to private school, the state educational resource can be used for others.

<sup>iii</sup> This educational function is more overt in the US; illustrated by a quote from Dorling (2015) *Injustice*, p72 “the aim was to turn children into tax paying automata who will never burglarize your home” from a headteacher in a Chicago school.

<sup>iv</sup> A number of universities operate a contextual offer that results in accepting some students from state schools with a lower tariff compared with that offered to other students. For example, see Bristol here: <http://www.bristol.ac.uk/study/undergraduate/entry-requirements-qualifications/contextual-offers/> and Birmingham here <https://www.birmingham.ac.uk/undergraduate/requirements/Contextual-Offer.aspx>

<sup>v</sup> Because of their relatively small size, the algorithm did not touch the grades of many private schools, see [Awarding GCSE, AS, A level, advanced extension awards and extended project qualifications in summer 2020: interim report \(publishing.service.gov.uk\)](#) and [Ofqual exam results algorithm - Wikipedia](#)

<sup>vi</sup> John Harris article that quotes Musa Okwongas’ “Visible effort is mocked at my school – the trick is to achieve without seeming to try” from Musa’s ‘One of Them’ memoir of his time at Eton. See [Britain’s overgrown Eton schoolboys have turned the country into their playground | John Harris | The Guardian](#)

<sup>vii</sup> The Independent School Council reports that "The independent sector educates around 6.5% of the total number of school children in the UK (and over 7% of the total number of school children in England)" see <https://www.isc.co.uk/research/>

<sup>viii</sup> In a review for the EEF, Allen et al. (2018) reported ICC values between 0.07 (KS1 maths or English) and 0.16 (KS4 English).

<sup>ix</sup> The LSYPE is now known as 'next steps', see <https://cls.ucl.ac.uk/cls-studies/next-steps/>

<sup>x</sup> FSM data is not submitted to the NPD by private schools and it seems reasonable to assume that the proportion would be relatively small.

<sup>xi</sup> See <https://www.independent.co.uk/news/education/education-news/university-college-london-eugenics-probe-secret-conference-campus-ucl-white-supremacists-debate-lci-a8153326.html>

<sup>xii</sup> Robert Plomin practices under the name of 'behavioural genetics' and was consulted by Cummings and Gove in 2013 ahead of seismic changes to assessments at KS2 (age 11, end of primary) and KS4 (age 16, end of secondary) - see <https://www.theguardian.com/politics/2013/oct/12/michael-gove-special-adviser>

<sup>xiii</sup> See <https://www.theguardian.com/politics/2020/feb/17/andrew-sabisky-boris-johnsons-ex-adviser-in-his-own-words>

<sup>xiv</sup> See <https://educationendowmentfoundation.org.uk/evidence-summaries/teaching-learning-toolkit/setting-or-streaming/>

<sup>xv</sup> Ofsted (2013) The most able students available at <https://www.gov.uk/government/publications/are-the-most-able-students-doing-as-well-as-they-should-in-our-secondary-schools> . Whilst this does not explicitly call for setting / streaming, amongst the " common characteristics" for schools doing well for their most able students included statement "early identification of the most able students so that teaching was adapted, and the curriculum tailored" and "groupings that allowed the students to be stretched from the very start of secondary school".

<sup>xvi</sup> None of these projects are a representative sample of schools; they were recruited to educational trials before being randomly allocated into control or experiment/intervention groups. Whilst it is not appropriate to infer details from these studies more widely; the rare within-school statistical detail is of sociological interest and raises some notable statistical issues.

<sup>xvii</sup> See <https://educationendowmentfoundation.org.uk/projects-and-evaluation/projects/realistic-maths-education/>

<sup>xviii</sup> In the post-war years, primary schools became highly segregated in preparation for the 11+ exam to come.

<sup>xix</sup> See earlier discussion and use of contextual offers by many universities - ii above

<sup>xx</sup> See <https://nctl.blog.gov.uk/category/school-led-system/>

<sup>xxi</sup> The National Education Union mention the need for an independent review in a press release in August 2020 ([GCSE Results 2020 | NEU](#)) and more recently in April 2021 ([GCSE and A-Levels | NEU](#))

# **Bibby's Dilemma – a case of the Stigler fallacy How many children are in a family?**

**John Bibby**

Stigler's Law of Eponyms is well-known – that no discovery is named after its original discoverer. So Hubble's Law was not discovered by Hubble, Pythagoras's Theorem was not discovered by Pythagoras, and Stigler's Law was not discovered by Stigler.

Bibby's dilemma may be a further case in point. I've been vaguely aware of it but have only just articulated it. Where has it appeared before? What should it be called? is it important? Please let me know! I came across this while looking at the 1851 census in York, where the number of children in a household is discussed. How many children are there in a household, on average?

This seems to be a simple question but it has with different meanings which yield different answers depending upon which perspective you take. There are at least three different perspectives, which I shall call "the Household perspective", "the Household with Children perspective", and "the Children perspective".

In the York 1851 census, the number of children in a household (based on a 10% sample) varies from zero (in 34% of households) to "7 and over" (in 9.4%). But the dilemma is clearest with a simpler example.

Consider a population of 30 households: 10 have no children; 10 have one child; and 10 have 2 children i.e. 30 children in all. How many children are there in a household on average? I hold that the answer can be 1, or 1.5, or 1.67 depending on your point of view.

From the Household perspective we have 30 households and a total of 30 children. The average is 1.

From the Household with Children perspective we ignore households which have no children. This leaves 20 households with 30 children. The average is 1.5.

From the Children perspective we note that 10 children come from households with 1 child, and 20 come from households with 2 children. So the average from their point of view is  $(10 \times 1) + (20 \times 2) / 30 = 1.67$ .

My dilemma is: Is one of these averages more valid than the others? How should we distinguish between them? Does a similar dilemma come up in other places? Is choosing between these averages what we mean by “social production of statistics”? Is it a true dilemma, or is it just arithmetic?

The same dilemma exists in amplified form if we consider dispersion and higher moments.

In the York 1851 example, the three different perspectives gave means of 2.5, 3.7, and 4.7 children per household respectively. (Here there was the added complication of how to deal with “7 or more” children. I dealt with this in a cowardly manner, simply by assuming that each of these had 8 children. Undoubtedly wrong, and very wrong indeed if we are interested in dispersion and the tail.

But which to use, and how best to distinguish between them?

POST-SCRIPT: Since writing the above I have been in touch with Stephen Stigler who admonished me because “One of the lessons of Stigler’s Law is that you cannot spread the name yourself” (I plead guilty). He also reminded me of “an error of Galton’s: In studying famous scientists he came to the conclusion that devoting yourself to science diminished your fertility. He got there by comparing the average number of children the scientists had to the average number of children in the family they came from. Of course none came from a family with no children.” So “Bibby’s Dilemma” could be renamed “Galton’s Error”. Perhaps Galton was prompted to the fear of declining fertility by his own situation as the youngest of seven with no children of his own. So maybe he felt the need for a son. This could explain his strong relationship with Karl Pearson, whose inadequate father was born in the same year as Galton. (The reference is to pp. 36-37 of Galton’s (1874) *English Men of Science*; this could provide a useful teaching exercise in applications of statistics that require careful thought.)

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