Evaluating Sistema Scotland

Evaluation plan: Sistema Scotland's Big Noise programmes in Raploch, Stirling and in Govanhill, Glasgow

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Picture credit: Marc Marnie.

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Executive summary

Sistema Scotland is on a mission to transform lives through music. Through its 'Big Noise' programme Sistema Scotland believes that children from disadvantaged backgrounds can gain significant social benefits by playing in a symphony orchestra. The Glasgow Centre for Population Health (GCPH) operates within a research and evaluation sphere but has a similar transformative ethos and role to Sistema. The GCPH is a resource to generate insights, evidence and innovation and to provide leadership for action to improve health and tackle inequality. The GCPH is now working with Sistema Scotland and is leading the evaluation of the Big Noise programme in Raploch, Stirling and in Govanhill, Glasgow. The Big Noise Raploch has been established for six years and provides a variety of music-teaching formats and wider opportunities for pre-school and all school-age children and young people. The Big Noise Govanhill has been operational for one year and currently delivers music lessons during school time and after school for children in Primary 1 to Primary 3 (ages 5-7). The first part of the evaluation will conclude by March 2015 but, as this plan will make clear, a much longer timescale is required to truly assess the range of impacts and outcomes of the Big Noise programmes.

In keeping with the highest quality research in this field, this evaluation is approached and planned over the life-course of the children currently participating in the Big Noise programmes. It is also important that the evaluation gains insight into Sistema's ethos and ways of working. The evaluation will consider how the Big Noise programme has engaged so successfully with the Raploch community over the past five years and how this reach and uptake is approached within such a transient and diverse urban community as Govanhill.

The evaluation aims are to:

1.   Assess, over the long-term, the outcomes of the Big Noise programmes in Raploch and Govanhill, in terms of social and behavioural development, educational performance and attainment and future impacts on the lives, health and wellbeing of the children and young people participating in the programmes. Additionally the social impacts at a family and community level will be assessed. The impact of the programme at a societal level will be assessed through an economic analysis which will consider the costs of the programme and the broader returns on investment.

2.   Gain insight into Sistema Scotland's approach to selecting programme sites, adapting programme delivery to local structures and requirements, local partnership working and the characteristics of implementation which are critical to enhancing inclusion, engagement and retention and achieving positive outcomes at the individual, family, community and societal levels.

This plan begins by covering some important contextual evidence which underlines the importance of this evaluation and its relevance across a range of Scotland's policy challenges. The evidence reviewed outlines the need for effective social interventions, as part of the collective action required to address Scotland's poor health record. The review then describes the importance of early years as the key life stage at which future health trajectories are profoundly shaped. The review then discusses the characteristics of early years interventions which are important in influencing improvements to health and wellbeing in later life. Evidence concerning the impacts of the arts on health and wellbeing from national datasets and community level perspectives are then described and the quality of this literature is appraised. Evidence exploring the impacts of the arts on academic performance during the school years is also discussed.

The methodological principles required to achieve the evaluation aims are also covered within this plan. Dynamic and contextually-driven programmes such as Big Noise require a broad and flexible evaluation plan and framework. Some important areas for evaluation enquiry may only become clear when the evaluators have been working closely with the programme. Similarly, some specific aspects of the evaluation which were identified as important prior to fieldwork starting (September 2013) may become less of a priority as understanding of the programme and its mechanisms for change become clearer. From the outset, however, it is clear that the evaluation will be/will have:

- Longitudinal – the majority of the potential programme impacts, including those related to health and wellbeing will only be evident in the mid and later lives of the programme participants.
- Mixed method – there are important quantitative impacts to be measured and tracked with routinely-gathered linked data at the individual and community levels; however much of the insight into how Sistema operates, the

- A control design – in order to truly assess or 'isolate' the impacts of the Big Noise programme it is necessary to compare the outcomes of interest for Big Noise 'engagers' with those of a control group who do not have access to the Big Noise programme. Statistical analyses will determine the significance of the programme impacts and adjust for potentially confounding variables and variances such as socio-demographic differences between the Big Noise group and the control group.
- An economic component – the focus of the economic analysis will be to establish the cost of the Big Noise programme and, ultimately, to assess in the long-term any monetary savings that may result from investment in Big Noise programmes.

The evaluation will be inclusive, reciprocal and supportive in ethos. The GCPH will take responsibility for leading the evaluation process, from planning through to completion and dissemination. Sistema Scotland will work closely with the GCPH and related evaluation partners in progressing all aspects of the evaluation and provide a route to engage with Sistema staff and participants (children, families, carers) at agreed times and durations. The evaluation will also require input and contributions from a range of partners locally and nationally and at different stages throughout the evaluation process. Audit Scotland is a key evaluation partner until March 2015, contributing significant staffing resource and expertise to the evaluation process. Education Scotland will also contribute to the evaluation, lending their experience to the assessment of the educational impacts of the Big Noise programme. Colleagues from Glasgow Caledonian University are undertaking the economic analysis component of the evaluation.

The first GCPH-led evaluation report will be available by March 2015. It is important to be clear at this stage as to what to expect from this report. As already stated, the majority of outcomes of interest can only be assessed over the long-term; however, there is much that can be learned in the shorter-term. The substance of the 2015 report will be primarily qualitative, making clear the causal pathways linking aspects of the programme to the intended outcomes; discussing and exploring assumptions within these pathways. The report will also document process learning; illuminating Sistema's ethos and vision, how the organisation goes about its work, how a Big Noise site is established, how the community and wider partners are engaged, what

characteristics are important in becoming a Big Noise staff member and what criteria are used to decide where the Big Noise programme goes next.

The report will also contain case studies, focusing on the child participants' journeys; the successes, the milestones, the difficulties, their thoughts on the programme and their aspirations for the future. The views of child participants, their parents and guardians, their teachers and their Big Noise musicians will be synthesised in order to provide rich insights and actionable recommendations for the future of Sistema Scotland and Big Noise programmes.

The report will profile programme participants and their levels of programme engagement, provide baseline measures of individual and community outcomes of interest and an economic analysis of costing within the programme sites.

The evaluation of Sistema Scotland is extremely complex and the GCPH will lead this work with the aspiration of achieving positive influence within a range of Scotland's policy frameworks. The evaluation will achieve very little without the commitment and energy of a wide range of partners. Furthermore this commitment and energy must be sustained for many years to come if the impacts of Sistema Scotland's work are to be assessed.

Introduction

Sistema Scotland

Sistema Scotland's Big Noise programmes in Raploch, Stirling and in Govanhill, Glasgow are perhaps the highest profile social interventions in Scotland. Sistema Scotland is a charity "on a mission to transform lives through music". Through the Big Noise programme Sistema Scotland believes that children from disadvantaged backgrounds can gain significant social benefits by playing in a symphony orchestra[1]. Based on the Venezuelan El Sistema model[2,3], Sistema Scotland use music-making to foster confidence, discipline, teamwork, pride and aspiration; in the children taking part, their families and across their wider community.

The Big Noise Raploch was established in 2008 and provides free music lessons for pre-school and school-age children and young people. A variety of music-teaching formats are delivered during school time, after school and over school holidays. The Big Noise programme also involves regular performances and wider opportunities for development such as local and international trips. The Big Noise Govanhill has been operational for just one year and currently delivers music lessons during school time and after school for children in Primary 1 to Primary 3 (ages 5-7), although this level of delivery will expand year on year.

Anyone visiting the now well-established Big Noise programme in Raploch cannot fail to be struck by the intuitive benefits and appeal of the programme and its delivery. The passion and commitment shown by Sistema Scotland staff are impressive and engaging. Indeed the 2011 Scottish Government-led evaluation of the Big Noise Raploch programme reported very positive gains for the children participating and their families (within the constraints of the cross-sectional evaluation design)[4]. The evaluation reported that the Big Noise programme is progressive, immersive and inclusive; potentially contributing to a range of national outcomes[4].

Sistema Scotland is currently in a pivotal stage of its development as the programme moves from a 'one-off phenomenon' in Raploch towards developing a model of delivery in Govanhill; and potentially across Scotland, with several local authorities expressing interest in initiating their own Big Noise programmes at the time of writing. At this important juncture, and building on the learning from the 2011 evaluation, it is clear that more needs to be learned concerning how Sistema Scotland operates,

whether the Big Noise programmes represent 'good value' and whether they achieve the desired impacts on the children participating, their families and their wider community.

The first part of the evaluation will conclude by March 2015 but, as this plan will make clear, a much longer timescale is required to truly assess the range of impacts and outcomes of the Big Noise programmes.

The Glasgow Centre for Population Health

The Glasgow Centre for Population Health (henceforth the GCPH, the Centre)[5] will lead the evaluation of Sistema Scotland's Big Noise programmes in Govanhill and Raploch. The GCPH was established in 2004 and is a resource to generate insights and evidence, to create new solutions and provide leadership for action to improve health and tackle inequality.

Based in Glasgow, the Centre has a focus on the particular characteristics of this city, but the GCPH's approaches and learning have implications for other cities and regions. The GCPH works across the boundaries of research, policy, implementation and community life to shape a healthier future for Scotland. The Centre is committed to being an inclusive and reciprocal organisation; through research and evaluation approaches as well as a comprehensive series of events, seminars and workshops. The Centre brings people with diverse backgrounds and different perspectives together, to commit to fresh thinking and approaches to improve the health of Glasgow and Scotland.

This evaluation plan outlines the evaluation vision, ethos, aims and methodological principles as well as making clear the contributions of key partner organisations in the delivery of the evaluation and summarises important evidence and literature relevant in shaping the development of the evaluation framework.

Overview of important contextual evidence

The shared challenge of Scotland's health inequalities

Health is an exquisitely sensitive indicator of our societal structures, economic conditions and political priorities[6]. Health is also an elegant gauge of the physical and social fabric of our communities and of our individual journeys through life – from the nurturing received and opportunities available during the early years of life, through to the experiences and challenges encountered in adulthood and in later life[7]. The health of the nation is a definitive and unifying societal measure, reflecting these individual, collective and cumulative influences, experiences, challenges and journeys.

For several decades Scotland's health has fared poorly relative to that of comparable European countries[8]. There is much to consider as to how to improve Scotland's health record not least because the health of Scottish residents is influenced by several complex and interacting mechanisms which are socioeconomically patterned across the nation[9]. Genetic inheritance[10], economic conditions[11], environmental and physical characteristics of neighbourhoods[12], quality of housing[13], income[14], social connectedness within communities[15] and individual behavioural factors[16] all influence population health and health outcomes. The socioeconomic disparity in these and other important determinants of health mean that the health experiences of different groups is profoundly unequal[17]. Indeed it is recognised internationally that those living in disadvantage experience disproportionate levels of disease and reduced life expectancy relative to the better off in society[18].

Considering the complexity and diversity of mechanisms which affect health[19], it is clear that improving population health and reducing Scotland's health inequalities must involve a variety of sectors and incorporate a wide range of skills and inputs, beyond that of health professionals and the NHS alone[20]. This is a fundamentally important point, it is also vital to recognise that the required collective skills and inputs must be appropriately deployed across several *levels* of society; from the way in which services are delivered 'on the ground', to the way in which budgets are prioritised at a regional level, to the political ideologies and priorities which shape policy responses and legislation passed within the Scottish Government.

The socio-behavioural determinants of modern disease

It is important to recognise that collective action across several levels of society is needed to address Scotland's health record. Some of the factors detrimental to health in Scotland (and other developed and developing countries) have changed in recent decades[21]. Important 'epidemiological transitions' have occurred, which present new and complex challenges to improving population health[22]. Infectious diseases and conditions associated with malnutrition, which were the major burdens to public health in the early 20th century, have all but been replaced by non-communicable diseases of socio-behavioural origin such as heart disease, obesity, depression, anxiety, alcoholism and drug misuse[21,23-25]. These contemporary diseases exert a disproportionate grip on Scotland's disadvantaged communities[26-28]. The aetiology of such disease is embedded within social class[29], damaging social behaviours[30] and coping mechanisms[31], addiction[32], overconsumption[33] and social exclusion[34].

These social determinants of health and disease are recognised, but an intractable set of questions remain, namely what sort of action is required to address them, how the described collective skills and inputs can best be utilised in mitigating social determinants, and how such social action should be implemented 'on the ground' with limited and increasingly constrained resource. These questions face Scottish society at a number of *levels*[35].

Empirical evidence collected from a study exploring reasons for Glasgow's 'excess mortality', highlights that there are consistently lower levels of social capital (participation, for example volunteering, trust and reciprocity) in Glasgow compared with Liverpool and Manchester[36] (UK cities with similar deprivation profiles and a history of deindustrialisation). The researchers conclude that these features of Glasgow's social and cultural fabric are plausible explanations for the city's excess mortality. While this Glasgow-based research highlights a need to place greater emphasis on building the social fabric of the city's communities, the extent to which these findings apply across other parts of Scotland is currently unknown.

In broader regeneration literature, the GoWell longitudinal study presents qualitative evidence that social regeneration (meaning action within communities to promote cohesion and address social exclusion) has been afforded less attention and investment than the more tangible and measurable physical and economic forms of regeneration[37]. The lack of priority afforded to social regeneration within wider

regeneration has been reported for some time in the grey literature[38,39] and is widely recognised in peer-reviewed research in this field in the UK[40-44] and beyond[45,46].

The pivotal importance of the early years

Social policy in Scotland[35,47-49] is aligned with international evidence in prioritising the early years as the key life-stage during which future health trajectories are determined[50-53] and when evidence-based, effective universal services[54,55] and high-quality interventions which are intensive and sustained can yield greatest impact[56-58]. However, evidence is also clear that some adverse circumstances and inequalities experienced in early life cannot be reversed[59]. Recent advances in biomedical research also highlight the connections between stresses in the pre-birth period and during the early years and a range of adverse behaviours, health outcomes and health inequalities in later life[60,61]. Although such stresses arise from a range of sources, poverty and income inequality are fundamental drivers of issues such as diminished access to care and services, neglect, lack of stimulation, inconsistent parenting, disease, violence, poor diet, poor housing, lower school attendance and attainment and exposure to harmful substances such as tobacco, alcohol and drugs[62,63].

Importantly in the context of this evaluation, early years inequalities in health and exposure to risk appear to be *equalised* over youth, with socioeconomic gradients in health *re-emerging* in adulthood[64], the relative contribution of age in the epidemiology of chronic disease being a critical factor here[65]. It is proposed that the influence of secondary school, the peer group and youth culture at this life-stage cut across those of the family, home and neighbourhood[64]. This health equalisation through youth is one factor making short-term evaluations of the health impacts of targeted early interventions largely ineffectual, underlining the importance of longitudinal, ideally 'life-course' evaluations in this field[66].

Within Scotland, policies to mitigate inequalities in the early years include a focus on parenting, quality pre-school provision, and action to promote health-promoting behaviours[35,49]. The evidence base concerning targeted social interventions for disadvantaged pre-schoolers or high-risk families and children is less clear cut; with some interventions being short-term and many evaluations lacking in methodological rigour particularly the absence of long-term analysis of outcomes, use of control groups, explication of programme causal pathways, consideration of replication or

up-scaling and economic components[67]. Arguably the gold standard example, in terms of the intervention quality and evaluative rigour comes from Michigan in the USA. The long-term evaluations of the 'HighScope Perry pre-school program' delivered as a randomised trial of 'active participatory learning approaches'[68] to high risk, disadvantaged children in Michigan in the 1960s, showed positive effects at average participant age of 27 years on test scores, grades, graduation from high school, home ownership and earnings, as well as significantly reduced crime rates and welfare use[69]. The study estimated a seven-fold return on investment at age 27. A more recent follow-up economic evaluation reports a 13-fold return at an average participant age of 40 years, primarily attributed to reduced criminality and imprisonment[70].

'Measurement' of the arts

In recent years the arts have been utilised as a vehicle for delivering social regeneration – to strengthen and improve communities, to address damaging social behaviours and enhance social capital and employability[71,72]. With the arts being used in this way within communities, funding bodies are applying greater scrutiny to assess the impacts of such investment[73] – a particular focus has been on examining the impact of the arts on social development within the early years[74].

Whether music, literature, visual or performance, 'the arts' have always played a profound and defining role across nations and within societies through their ability to express and share human emotion and experience[75]. Funding for the arts typically diminishes during times of economic recession and political turbulence[76]. However, during times of austerity the role of the arts arguably has its greatest relevance. Artists can raise awareness of social issues and challenge political ideologies and commonly-held perspectives with inspirational and innovative creations[77]. The American poet Dana Gioia (2007) passionately describes the role of the arts in society:

> *"Art is an irreplaceable way of understanding and expressing the world. There are some truths about life that can be expressed only as stories, or songs, or images. Art delights, instructs, consoles. It educates our emotion."*[78]

There are many complications and challenges in studying or measuring the impacts of the arts. Debates endure about whether the impacts of the arts can and should be

'measured' at all. Many arts advocates criticise the apparent reductionist process of attempting to quantify the intangible and intrinsic benefits of participation in the arts. By contrast Matarasso highlights the responsibility of the arts world to be engaged and involved in developing indicators which are able to measure subtle, creative and qualitative changes in society, and which will also help the sector to prove its own value[79,80]. Moriarty (1997) adopts a balanced and nuanced position, on the one hand validating the reasons for monitoring, measuring, assessing and evaluating the arts:

> *"to help to make the complex and intriguing web of creative exchange more visible, to articulate actual and potential achievement, to help us all move forward"[81]*

and on the other hand, recognising the apparent, inherent weakness of measuring such a diverse, multidimensional, experiential and emotionally driven phenomenon:

> *"Much that doesn't get measured does get done – beautifully, gratefully, with vigour and pride. Children are loved, friendships are nurtured, songs are written and sung, stories are told to entertain and encourage."[81]*

There are also art advocates who take a more extreme stance, and are unsupportive of any research which investigates positive crossover from the arts into other areas of life and skills development. They instead support research to explore the unique contribution of the arts to society and the benefits of the arts to the individual[78].

The arts, cultural participation, health and wellbeing
Since the early 1990s there has been an increasing focus on measuring the health impacts of participation in the arts (described in the literature as 'cultural participation') across a number of scientific fields[78]. The societal benefits of participation in art, culture and sport appear to have been the focus of research and policy within Scandinavian countries for several decades. In recent years Scandinavia has produced a number of longitudinal epidemiological studies examining the association between cultural participation and mortality. By contrast, in Scotland, questions on cultural and sport participation were only added to the Scottish Household Survey in 2007, with the addition of self-assessed health and life satisfaction questions in 2009[82].

The 2012 London Olympics and 2014 Glasgow Commonwealth Games have increased both the political awareness of and the research profile of the societal impacts or 'legacy' of cultural and sport attendance and participation within the UK[83]. A 2013 Scottish Government study examined the interactions between the newly available data on cultural and sport participation and data on self-rated health and life satisfaction from the Scottish Household Survey[84]. Those who participated in cultural activities were nearly 38% more likely to have reported good health and were 30% more likely to have reported they were satisfied with their lives compared with those who had not participated in any cultural activity in the previous 12 months. Furthermore, those who attended a cultural place or event were over one-and-a-half times more likely to report high life satisfaction compared with those who did not attend any cultural place or event in the previous 12 months. These correlations remained statistically significant after adjusting for potentially confounding covariates including age, economic status, income, area deprivation, education qualification, disability/or long-standing illness and smoking. Given how recently the national collection of cultural data was initiated within the Scottish Household Survey data, there are no longitudinal Scottish studies examining the impacts of cultural participation on actual health outcomes; this remains an important research focus in this field within Scotland.

A Swedish longitudinal study (sample size: 10,609 adults) published in 2000 reported significantly lower mortality rates over a 14-year period (adjusting for covariates such as age, sex, disposable income, educational standard, long-term disease, smoking, and physical exercise) for individuals who regularly visited the cinema, concerts, museums, or art exhibitions compared with those who rarely visited them[85]. A 2005 Finnish study examined the cultural participation and survival of 8,000 adults over a 20 year period[86]. This study reports a positive correlation between cultural/arts participation and reduced mortality in men, but not in women (adjusting for appropriate demographic and health covariates).

A 2009, 13-year longitudinal Swedish study (sample size: 9,011 cancer-free adults as of 1990/1) investigated cultural attendance and cancer-related mortality; the findings of the study were striking[87]. Rare and moderate cultural attendees were 3.23 (95% CI: 1.60-6.52) and 2.92 (95% CI: 1.52-5.62) times, respectively, more likely to die of cancer during the follow-up period (2003) than frequent cultural attendees (adjusting for covariates age, sex, chronic conditions, disposable income, educational attainment, smoking status, leisure time, physical activity, and urban/non-urban

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residency). Interestingly the effect was observed only among residents of urban areas.

These and other Scandinavian longitudinal studies demonstrate the correlation between cultural/arts attendance and reduced mortality. The fact that these relationships remain significant after adjusting for socioeconomic variables is striking. These studies do not however illuminate the causal pathway between cultural and arts attendance and health. In the absence of satisfactory causal logic, it is clear that correlation should not be reported as causation[88].

The predominant hypothesised pathway (as summarised by Angus, 1999) between cultural attendance and health is that attendance improves mental health, perhaps reducing stress which, in turn, improves health and longevity[89]. There is an important inequalities dimension here where socioeconomic disadvantage is associated with poorer mental health, increased stress and worsened health outcomes[90]. Alternatively it may be that good mental health (and related characteristics such as strong individual resilience[91] and social capital[92]) predicts both cultural engagement and longevity. Without accounting for the role of mental health within the analyses of these Scandinavian studies, both pathways remain possibilities.

'Arts and smarts' – the impact of the arts on educational performance during the school years

Arguably, greater scrutiny of the causal pathway between the arts and health has taken place within an educational context. The seminal 'Mozart Effect' study sparked international interest in the field. This study reported that students who listened to the music of Mozart for ten minutes before taking an intelligence test improved their scores in comparison with a control group[93,94]. The proposed casual pathway within this body of evidence has been termed by some as 'arts and smarts'[78], where a number of studies report enhanced academic performance and attainment[95] and greater discipline[96] for children learning musical instruments. The hypothesised implications for future health trajectories are obvious; higher levels of academic attainment are associated with better health outcomes in later life[97], due, in part, to the increased potential for higher income[98] and better quality employment[99].

The 'correlation is not causation' argument again could be levelled at this evidence. Studies to date have not fully addressed the issue of self-selection. It may be that the

more self-motivated, engaged and disciplined students gravitate towards arts curricula or interventions thus explaining the reported association between arts participation and educational attainment. Until this point can be addressed methodologically there remains significant doubt over the 'arts and smarts' evidence base.

In one of the few randomised studies in this field, Neville *et al.* (2009) demonstrated significantly enhanced spatial skills, numeracy and other non-verbal IQ skills in disadvantaged pre-school children enrolled in an intensive music programme compared with a control group who were not[100]. However, the increased skill in the musical cohort was similar to another control group who received non-musical, intensive training in 'focusing attention and becoming aware of details'. This study highlights that intense adult attention within smaller class sizes is critical to enhanced learning and attention skills – and that music teaching is an effective vehicle for this. Skills in maintaining attention are fundamental to effective learning and are significantly worse in children of a disadvantaged background[101]. The study does not, however, illuminate the potential for increased social bonds and levels of enjoyment within the musical and non-musical groups. Related to this point is whether progress, learning and interest are maintained over the longer-term, comparing the musical versus non-musical groups. These issues illustrate the importance of longitudinal approaches and mixed method studies in this field; where quantitative rigour should be integrated with qualitative insight, context and meaning.

In recent years research within the broad field of neurological imaging has come to the fore within the 'arts and smarts' literature. Neurological imaging has the potential to illuminate the causal pathway between arts (particularly music) participation and enhanced brain functioning (primarily 'executive functioning' and related cognitive processing[102]) thus enabling higher academic performance. Wandell *et al.* (2008) report an association between musical training and improved reading fluency, phonological awareness and mathematical calculations[103]. The study uses brain imaging techniques to demonstrate changes to the anatomy of the corpus callosum, a structure connecting the left side of the brain (generally described as having function in logical reasoning) and the right side of the brain (generally described as being the perceptual and creative side of brain[104]). Greater diffusion in the bundle of nerve fibres that connect the brain's temporal lobes is correlated with measures of reading ability; with phonological awareness showing the strongest correlation.

International cognitive neuroscience expert Michael Gazzaniga frames current levels of learning and insight from these studies and related neurological techniques as important yet inconclusive early steps:

> *"A life-affirming dimension is opening up in neuroscience; to discover how the performance and appreciation of the arts enlarge cognitive capacities will be a long step forward in learning how better to learn."*[105]

Community-based arts programmes and inequalities

A distinction is now made between the broad arts and cultural attendance/participation evidence reviewed so far, arts as part of the schooling curricula, and 'community-based arts programmes'.

Although varied, community arts programmes are grassroots organisations that attempt to use the arts as a tool for human or material development[106]. The scale, diversity and complexity of programmes, approaches and mechanisms through which community-based arts programmes may potentially impact on participants and community make studies challenging to compare and findings difficult to generalise[74].

There have been positive claims made by researchers as to the social[107], economic[108] and cultural[109] impacts of community-based arts programmes. However these topics have not been the object of extensive study (coming to the fore in the 1990s) and the evidence behind some of these claims is questionable[71]. Quantifying the impact of the arts, especially in terms of 'social gain' presents considerable difficulties, arguably greater than in any other field of evaluation[72]. It is a recurring criticism that the direct impacts on participants of community-based arts programmes are often reported as impacts on the community[74].

Most evaluations of community-based arts projects tend to adopt a very short-term or cross-sectional design[110,111] and seldom discuss, let alone justify, the particular theoretical and methodological choices made within the study[74]. Little emphasis has been placed on learning from programme implementation; to further the collective understanding of best practice in this field. Moreover, few studies report on aggregation of impacts beyond that of the individual.

The literature concerning the impact of community-based arts on health inequalities (that is, the potential for targeted arts programme delivery to raise the health and wellbeing levels of residents within disadvantaged areas more in line with the rest of society) is generally qualitative in nature and is more nuanced than the wider literature reviewed so far. Passive participation such as community members attending local performances may relieve stress and be stimulating; potentially enhancing wellbeing[112]. Attendance may also foster feelings of pride: for example a parent attending a music performance where their child is playing; or potentially pride in the wider community and a greater sense of connection to the community. Attendance at a community performance may also promote new social circles within the community and lead to gained knowledge and cultural capital[113].

In terms of direct participation, the process of creation and completion is enjoyable but also provides an opportunity for disadvantaged individuals (when delivery is targeted within deprived communities) to experience success and to perhaps be publicly recognised and appreciated[114-116]. Participation may enhance a sense of control over their life and self-concept, crucially where hard work, discipline and teamwork are directly rewarded by success, recognition and appreciation. This is in addition to learning new skills and realising creative potential and undiscovered talent, which can potentially enhance self-esteem and employability[117].

Direct participation in community-based arts programmes also creates new social contact and networks. Within programmes which involve group or teamwork, trust and reciprocity can be fostered and there may be opportunities for interactions with positive role models[118]. Participation can also promote tolerance and awareness of other races, religions and cultures within multicultural communities[119]. Additionally skills wider than the actual creation or performance of the arts can be learned. For example, a community-based musical performance also requires planning, logistics, staging, lighting, audio engineering, recording, events management, marketing, community engagement, and so on[116]. Many programmes within disadvantaged areas make these broader skills part of the programme delivery for participants. Participating in a community-based arts programme may also offer experience of working with third sector organisations and local government[120].

The presence of arts organisations within disadvantaged communities can have economic advantages through enhancing community reputation and appeal; attracting new residents and businesses alike[106]. The arts organisation may also

employ skilled workers who could potentially re-locate to the area and/or spend money within the community[108].

Making sense of the evidence at this stage

The evidence concerning the impacts of the arts on health and wellbeing is broad and complex. Indeed, as the literature summarised above suggests, any measurement of the arts is inherently difficult. This plan describes and categorises the evidence under three distinct themes relevant to informing the development of the Big Noise programme and this evaluation.

Firstly, within the studies linking national arts and cultural surveys to health outcomes, there are clear positive associations between arts and cultural participation and improved health and longevity. However, there remains some doubt over the causal pathways, particularly the role of mental health as a mediating variable. Similarly the 'arts and smarts' evidence base reports positive associations between arts and cultural participation and enhanced academic performance. However the causal pathways once again are less clear with self-selection bias not well addressed in many studies.

The evidence concerning the impacts of community-based arts interventions on health and wellbeing is very broad and disparate making studies and evaluations difficult to compare and findings challenging to generalise. It is clear that the evidence concerning community-based arts interventions tends to be qualitative and cross-sectional. Going by traditional notions of the evidence hierarchy, this evidence would be considered 'weak'. However, it must be recognised that evaluation in this field is relatively new, is extremely complex and is generally not well resourced.

Arriving at succinct points of learning and recommendations from reviewing evidence concerning the impact of the arts on health is challenging. Despite the caveats summarised above, there is evidence of a link between arts participation and health and wellbeing. Experiences in the early years of a child's life form the foundations on which their future health and wellbeing are built. High quality, sustained and immersive early years interventions can make a positive impact on future health trajectories. It is also apparent that to assess the outcomes and impacts of arts on health, mixed method, longitudinal studies are appropriate, ideally with a control design.

As part of the evaluation of Sistema Scotland, the GCPH will commission literature reviews in each of the described three themes:

1. The arts, cultural participation, attendance and health
2. 'Arts and smarts' – assessing the impact of arts participation on academic performance during the school years
3. Community-based arts and music programmes, health and inequalities.

Given the nature of the evidence discussed it is likely that the arts and health and arts and smarts themes will be subject to systematic review, while the evidence concerning community-based arts interventions will be critically reviewed. Additionally, the findings of all three evidence reviews will be synthesised and concisely summarised with policy, practice and further research implications and recommendations made clear. These literature reviews will be published in autumn 2014.

Evaluation framework

This section of the evaluation plan outlines what the evaluation will do, how it will be done and what to expect from the first evaluation outputs by March 2015.

Evaluation vision

The vision for the evaluation is to capture important learning from the implementation and impact of Sistema's work in Govanhill and Raploch as a means of furthering understanding, within Scotland and beyond, of effective, targeted community-based social interventions within disadvantaged areas. The primary focus of the evaluation is to ascertain the contribution made by Sistema towards transforming the health, wellbeing and prospects of children residing in the programme sites who engage with the project. The evaluation will build as complete an understanding as possible about the processes that are integral to the Sistema approach, and the pathways between that approach and health impacts at a range of levels. Furthermore, the evaluation will consider the role that the Sistema approach might play in helping to generate better, and more equitable, population health outcomes in Glasgow and Stirling.

Evaluation ethos

The evaluation approach will be inclusive, reciprocal, supportive and flexible. The GCPH will take responsibility for leading the evaluation process, from planning through to completion and dissemination. Sistema Scotland will work closely with the Centre and related evaluation partners in progressing all aspects of the evaluation and provide a route to engage with Sistema staff and participants (children, families, carers) at agreed times and durations. The evaluation will also require input and contributions from a range of partners locally and nationally and at different stages throughout the evaluation process.

The evaluation recognises from the outset that the Big Noise programmes are complex, adaptive and dynamic systems[121] that will and should change over time. Thus, there may be a degree of uncertainty surrounding the programme pathways and the timeline for anticipated impacts[122]. The evaluation must be flexible and adaptive, responding to the evolution of Sistema Scotland and the Big Noise programmes but also paying attention to new evidence within this field and the wider policy context in which the programmes operate[123]. To this end the evaluation plan and framework is broad in nature. The evaluation aims to support the quality and sustainability of the Big Noise programme; while there is an expectation for evaluation outputs by March 2015 the evaluation team must also be alive to less formalised 'dynamic learning' from the Big Noise programmes[124]. This learning

should inform Sistema Scotland and may be disseminated through the evaluation advisory group and other appropriate networks.

Evaluation aims

There are two overarching aims for the evaluation. Aim one relates to assessing the outcomes and impacts of the programme at varied *levels*. Evaluation aim two concerns the process and related learning from the implementation of the programmes in Raploch and Govanhill. It will:

1.   Assess, over the long-term, the outcomes of the Big Noise programmes in Raploch and Govanhill, in terms of social and behavioural development, educational performance and attainment and future impacts on the lives, health and wellbeing of the children and young people participating in the programmes. Additionally the social impacts at the family and community levels will be assessed. The impacts of the programme at a societal level will be assessed through an economic analysis which will consider the costs of the programme and the broader returns on investment.

2.   Gain insight into Sistema Scotland's ethos and vision, their approaches to selecting programme sites, adapting programme delivery to local structures and requirements, local partnership working and the characteristics of the staff and implementation which are critical to enhancing inclusion, engagement and retention and achieving positive outcomes for the individual, family and community.

The 'methodological principles' section of the plan clarifies the methods involved in the evaluation and the rationale for these choices. The evaluation aims focus on various societal 'layers' and the methods need to be relevant to these different scales of impact. Evaluation aim one will focus on four of these layers – the individual (child programme participants), the family (of programme participants), the community (e.g. Raploch and Govanhill) and regional/societal (e.g. Stirling, Glasgow and/or Scotland as a nation). Table 1 summarises the four layers described and the core methods adopted within the evaluation for each layer.

Table 1. Evaluation aim one.

Societal layer	Core evaluation methods
Individual participants	Quantitative long-term tracking of key programme participant outcomes throughout the life-course focusing on educational, health, social care and justice system data. Quantitative short- to mid-term tracking (over pre-school and school years) of social development and wellbeing using routine educational data including Strengths and Difficulties Questionnaire (SDQ) data, where possible. Qualitative case studies primarily using interview and observation methods to explore participants' journeys, development, milestones and challenges, including their views of the programme and aspirations for the future. Qualitative synthesis of individual participants' views with those of their family, Big Noise musicians and school teachers. Potential to revisit case studies from 2011 evaluation of Big Noise Raploch enabling longer-term insights.
Family	Qualitative case studies using interviews to explore changes to family dynamics; feedback from parents/guardians on their children's development; capturing their views on the programme and aspirations for their children. Potential to revisit case studies from 2011 evaluation of Big Noise Raploch enabling longer-term insights.
Community	Quantitative long-term tracking of community social capital and cohesion within programme sites, where possible. Qualitative case studies based predominantly on observation exploring changes to community dynamics, sense of identity and pride. Crossover and potential synthesis with data gathered at individual and family levels where important insights emerge.
Society/region	Quantitative economic evaluation of programme costs and long-term return on investment.

Evaluation aim two involves a focus across three distinct layers which aim to illuminate the vision, ethos and ways of working of Sistema Scotland. The first layer is concerned with 'on the ground' programme delivery, gaining insights primarily from Big Noise musicians and support staff. The second layer considers broadly of Sistema Scotland's organisational characteristics including ethos, vision, governance, operation and strategic development. The final layer examines how Sistema engages and works with local partners and the community members.

Table 2. Evaluation aim two.

Programme layer	Core evaluation methods
Programme delivery	Qualitative triangulation of approaches using ethnographic observation of programme delivery, interviews with Big Noise musicians and support staff and related documentary analyses. These methods are intended to explore key characteristics of the Big Noise programme which are important within the theorised pathways to achieving the anticipated outcomes and impacts explored within evaluation aim one. These methods and analyses will enable a description of programme theory and assumptions and will highlight delivery challenges and important areas for reflection relevant to the ongoing development of Big Noise. There is scope to synthesise these qualitative insights from programme delivery with those from individual programme participants and families to potentially yield richer learning.
Organisational characteristics	Qualitative triangulation of approaches using ethnographic observation of Sistema Scotland's organisational working and strategic development. This will be supplemented with documentary analysis and interviews with board members, leadership roles and support staff to explore matters such as organisational vision, ethos, structure and governance. These data will be synthesised with data gathered from Big Noise musicians where important insights emerge.
Engagement and partnership working	Qualitative triangulation of approaches to gain insights and learning from partnership engagement and working, including the community, at operational and strategic levels. Methods used will include ethnographic observation and documentary analyses supplemented by interviews with board members, those in leadership roles, support staff, programme staff, community members, external partners and funders. There is scope to synthesise these data with programme delivery and organisational characteristics data as well as insights gathered from individual programme participants and families in evaluation aim one.

When considering the evaluation aims, particularly aim one, it is important to distinguish between outcomes and impacts which Sistema Scotland wish to achieve and those which the evaluation seeks to measure. Sistema Scotland's 2011 Business Plan describes how, through the orchestra, the programme will develop children's social skills, confidence, aspiration and drive; enabling the growth of children's respect, understanding and empathy of one another and emotional intelligence. These skills aim to prepare children to choose their own path in life.

Even the most established and developed programmes benefit from explication of the programme aims, theory and anticipated timeline of impacts[125-127]. Benefits to educational performance and attainment arising from the Big Noise programme are largely implied but not definitively articulated aims of Sistema Scotland. Indeed enhancing the health and wellbeing of the children and young people participating in the programmes is *not* currently a strategic aim of Sistema Scotland. Rather, based in part on the evidence reviewed, it is the expectation of the GCPH that these impacts on health and wellbeing are possible and measurable in the longer-term.

The two overarching evaluation aims have been distilled down to specific research questions and measures which are detailed in matrix form in Appendix A. The anticipated long-term quantitative outcomes that are to be linked and tracked over the life-course of the individual programme participants are listed in Appendix B.

Methodological principles

Based on the evidence reviewed so far, and on the GCPH's experience and expertise in this field, there are some key methodological principles which must be incorporated into the evaluation design in order to deliver high-quality and credible evaluation outputs. The evaluation design must be/include:

Longitudinal – The evaluation must incorporate the long-term monitoring of programme participants and their outcomes. Ideally this would happen over the life-course – and the evaluation is being designed with this aspiration, although current resourcing is much shorter-term. The three key reasons for taking a long-term view of impacts are: firstly, to assess the extent to which changes as a result of the programme are sustained over time; secondly, to understand more fully the pathways between the programme and the changed outcomes, and; thirdly, some of the anticipated impacts to health will only be evident over the very long-term. It is important therefore that the evaluation is set up in a transparent manner and datasets carefully prepared in order that the programme impacts can be tracked for decades to come and potentially by researchers other than the GCPH. Some shorter-term health variables are also of interest also, e.g. health behaviours. Additionally there will be worthwhile routinely-gathered measures of social development (e.g. the Strengths and Difficulties Questionnaire), and related variables, which can be tracked in the short term. However, other markers of the determinants of health (such as educational attainment) are by their nature more medium-term and impacts on actual

health and wellbeing outcomes are, as described, likely to be evidenced in the long term. For a full list of the proposed quantitative data items for the long-term tracking of programme participants' outcomes please see Appendix B.

Mixed methods – The evaluation will utilise both quantitative and qualitative methods. Quantitative methods will be adopted to capture the outcomes and impacts of the Big Noise programmes. Primarily, this will involve accessing routinely gathered data from a range of partners including the NHS, local authority, justice system and the welfare system. These data will be linked and tracked at agreed periods throughout the life-course of the programme participants.

Qualitative methods such as ethnographic observation, interviews, focus groups and documentary analysis will be utilised to explore the anticipated causal pathways linking aspects of the programme to the intended outcomes. Qualitative approaches will also be used to capture detailed process learning: illuminating Sistema's ethos and vision; how the organisation goes about its work; how a Big Noise site is established; how the community and wider partners are engaged; what characteristics are important in becoming a Big Noise staff member; and, what criteria are used to decide where the Big Noise programme goes next.

An overview based on qualitative analysis of the organisation's governance and management arrangements will be useful contextual learning regarding Sistema Scotland's culture, how the organisation plans and delivers sustainable growth, and what makes it successful in establishing effective working relationships with key partners. As described in the introduction section of this plan, Sistema Scotland is at a very important juncture in the organisation's development. It is anticipated that there will be rich process learning from developing and delivering the Govanhill Big Noise programme, such as establishing the programme principles which are directly transferable from the Big Noise Raploch and the methods and approaches which require to be tailored to the Govanhill context.

Also included will be qualitative case studies, focusing on the child participants' journeys; the successes, the milestones, the difficulties, their thoughts on the programme and their aspirations for the future. The views of child participants, their parents and guardians, their teachers and their Big Noise musicians will be

synthesised in order to provide rich insights and actionable recommendations to inform the future development of Sistema Scotland and Big Noise programmes.

Crucially the quantitative and qualitative methods used will not be approached in isolation. Rather a progressive synthesis of both forms of data will be pursued from the outset, enabling dynamic learning and a richer understanding of process, mechanisms and outcomes. This approach may also generate new research questions and lines of investigation within the evaluation aims, underlying the point that the evaluation plan needs to be broad and its delivery flexible and adaptable.

Control design – The evaluation will compare outcome measures for 'Sistema-engagers' with those of suitable control groups, i.e. neighbourhoods or communities or individuals of a similar socio-demographic profile, perhaps within the region of each Big Noise programme site. There may also be potential to compare some measures within each programme site with Scottish averages. This will be a central methodology in assessing the impact of the Sistema programme at the individual and, potentially, the community level. The comparison will be undertaken using multi-level statistical modelling to control for potentially confounding variables and variances such as socio-demographic differences between the Sistema engager group and control groups. This analysis will seek to quantify, in objective terms, the effects of the Sistema programme on the agreed outcomes of interest.

It is believed that Sistema Scotland's immersive, intensive and sustained delivery of the Big Noise programme will allow its impacts to be visible and measurable beyond the myriad of other influences on individual health at a community level. Indeed research designs such as this – involving control groups and regression statistical techniques – are specifically designed to enable attribution within analysis where there are many complex and interacting variables impacting on outcomes of interest[128].

Economic component – The exploration of the regional or societal benefits of Sistema's work will primarily involve an economic analysis. This analysis is to establish the cost of the intervention and to assess in the long-term the monetary savings that may result from the Big Noise programme. Colleagues from Glasgow Caledonian University will lead on this part of the evaluation and a more comprehensive overview of their approach to the economic evaluation can be found

in Appendix C. As with all other aspects of the evaluation the economic component will report to the evaluation advisory group.

The role of the GCPH

The Centre's role within the evaluation is to lead the collection of reliable data that will describe key impacts and outcomes of Sistema's work on programme participants, their families, their community and the wider benefits of this work at a regional or societal level. The GCPH will analyse these data in a way that will help inform how the respective Sistema programmes develop, as well as making clear the characteristics of Sistema's approach that are important to achieving positive outcomes on a range of agreed indicators.

The Centre will contribute funds from its core budget over the financial years 2013/14 and 2014/15. The majority of these monies will be used to fund a full-time research post to co-ordinate the evaluation and play the central role in its implementation. The post holder will liaise with Sistema and other partners in order to organise and conduct the fieldwork. They will also analyse data, write reports and present and disseminate the evaluation findings. Time and expertise of the Centre's Director and Senior Public Health Research Specialist will also be contributed to the evaluation from the outset and throughout. The funding for the researcher is in place until March 2015 in the first instance. By March 2015 a range of evaluation outputs, including a report, will be produced; these outputs will conclude the first phase of Sistema Scotland's evaluation.

Additional evaluation partners

In addition to the resources provided by the GCPH, Audit Scotland has funded a part-time research post (0.6 full-time equivalent) to support the ongoing evaluation and monitoring of the Big Noise Raploch, until March 2015. The post holder will bring broad experience in assessing service effectiveness and value for money. While employed and managed by Audit Scotland it is agreed that this role will take guidance from the GCPH on matters relating to the evaluation, and will work as part of the evaluation team and to the evaluation framework agreed by the evaluation advisory group. Audit Scotland's contribution to the first evaluation outputs (to be delivered by March 2015) will be significant.

Education Scotland will also be contributing to the March 2015 report, performing a week-long visit to the Big Noise Raploch programme in autumn 2014. The focus of this visit is to assess the educational impacts of the Big Noise programme. The findings of this visit will supplement those of the GCPH and Audit Scotland and will feed into the report accordingly. Similarly, health economist colleagues from Glasgow Caledonian University will contribute to the first evaluation report by leading the economic analyses. This will mean close working between the respective GCPH, Audit Scotland, Education Scotland and Glasgow Caledonian University staff at least until March 2015.

The role of the evaluation advisory group
It is essential that the evaluation is built upon a strong partnership arrangement where a range of perspectives and expertise are utilised in the common pursuit of ensuring an effective and helpful evaluation, which has impact both locally and nationally. To achieve this, the evaluation advisory group will be central to establishing sustained working relationships with other researchers, practitioners and policy-makers within Glasgow, Stirling and nationally. The function of the evaluation advisory group is to provide advice in relation to the approach, content and implementation of the evaluation and dissemination processes and to contribute more hands-on support for particular aspects of the process, as required. Individual members of the advisory group may take lead responsibility for different aspects of the evaluation as appropriate as well as having a concern for the totality. The group is led by an independent chair. The decisions made within the group, the conduct of the evaluation overall, and the reporting of findings, will be carried out in an open and transparent way. A list of the Sistema Scotland evaluation advisory group members is available in Appendix D.

The role of the Raploch young persons' evaluation advisory group
An evaluation advisory group (anticipated to consist of between six and ten individuals) made up of older programme participants (anticipated age ten to 15 years) in the Big Noise Raploch will be established in summer 2014. The intended aim of this group is to serve as a useful 'sounding board' and counterpoint to the GCPH-led evaluation, the evaluation methods chosen and emergent learning.

It is intended that the group will meet frequently to begin with and perhaps every four to eight weeks thereafter. This group will be consulted to ensure that the key messages and learning from the evaluation represent their experiences of the Big Noise programme. The group will be supported by the GCPH and Audit Scotland

researchers. A proportion of the GCPH funding will be allocated to support the group. The money will be used to support the group in leading the production of a short film reflecting on their experiences of the Big Noise programme (this may require additional time from the group at key stages). The group members will be recognised for their contributions and it is hoped they will benefit both from the creative process and by developing new skills and interests in the fields of film-making, research and evaluation.

The first evaluation outputs by March 2015

It is important to be clear at this stage as to what to expect from the first GCPH-led evaluation report, available by March 2015. As already stated the majority of outcomes of interest can only be assessed over the long-term. However there is much that can be learned in the shorter-term. The following evaluation outputs will be delivered by March 2015:

- Literature reviews
    - Arts and health systematic review
    - 'Arts and smarts' systematic review
    - Community-based arts and health critical review
    - Synthesis summary
- Raploch young person's advisory group
    - Big Noise film
- March 2015 evaluation report
    - Qualitative elements
        - Big Noise programme logic model(s)
        - Big Noise programme delivery learning
        - Sistema Scotland organisational insights
        - Programme participant case studies, including synthesis of views from participants, parents, musicians and teachers
        - Big Noise programme milestones
    - Quantitative elements
        - Socio-demographic profile of programme participants
        - Programme engagement summary
        - Overview of social capital survey data
        - Overview of baseline routine data and linkage
        - Economic costing analysis

The GCPH-commissioned literature reviews covering the three evidence themes discussed earlier will be completed by late July 2014 and published in autumn 2014. These literature reviews will be utilised in the writing of the March 2015 report as they will assess the evidence concerning the causal pathways at work within the Big Noise programmes and will highlight key policies and research. It is also anticipated that the Raploch young person's evaluation advisory group will produce their Big Noise film by autumn 2014. It is hoped the production of the film will be a useful learning experience for the young people involved and will also serve as means to connect the views of Big Noise participants on the programme and its impact on their lives with a wider audience of Sistema Scotland stakeholders and those interested in this evaluation.

The substance of the 2015 report will be primarily qualitative findings which will make clear the causal pathways linking aspects of the programme to the intended outcomes as well as discussing and exploring the assumptions. This analysis will be presented in logic models and will be contextualised within the findings of the commissioned systematic reviews. The report will also document process learning; illuminating Sistema's ethos and vision, how the organisation goes about its work, how a Big Noise site is established, how the community and wider partners are engaged, what characteristics are important in becoming a Big Noise staff member and what criteria are used to decide where the Big Noise programme goes next and how Sistema Scotland approaches sustainable and responsible growth.

Case studies will be included, focusing on the child participants' journeys; the successes, the milestones, the difficulties, their thoughts on the programme and their aspirations for the future. The views of child participants, their parents/guardians, their teachers and the Big Noise musicians will be synthesised in order to provide insights and actionable recommendations for the future of Sistema Scotland and Big Noise programmes. Important milestones within the Big Noise timeline will also be included as case studies such as the Raploch children's visit to Caracas, Venezuela in 2014 and landmark performances.

The report will contain quantitative data, including a socio-demographic profile of programme participants and their levels of programme engagement, baseline measures of individual and community outcomes of interest and an economic analysis of costing within the programme sites. Importantly the report will also serve

as a blueprint for this innovative data linkage which is essential for the proposed 50-year tracking of the programme participants. Methodological challenges and ethical considerations will also be documented. It is hoped that the March 2015 report and this evaluation plan will be informative about the methodological approaches required to assess the impacts of the Big Noise programme. It is proposed that anything short of a life-course evaluation will not be sufficient to generate strong, quantitative evidence of programme impacts.

Concluding remarks

Addressing the origins of contemporary disease such as damaging social behaviours and coping mechanisms, addiction, overconsumption and social exclusion is extremely complex, meaning public health must move into new territories and work in different ways alongside a range of partners, providing a 'social' response to these issues. The GCPH will lead this complex evaluation, and is committed to achieving evidence-informed influence within a range of Scotland's policy frameworks. This will mean identifying and developing new and opportune ways of knowledge translation. The evaluation also involves a thorough exploration of programme logic and anticipated pathways and outcomes, mixed methods to capture important process learning and short- to medium-term evidence of process impact and outcomes at a variety of societal levels. Long-term linkage of routine data from a variety of data sources is proposed, using a control design, and presenting several methodological and ethical considerations.

The evaluation will achieve little without the commitment and energy of a wide range of evaluation partners in Glasgow, Stirling and nationally. It involves its partners in going 'the extra mile', to try new approaches and to work collaboratively with the GCPH, demonstrating a commitment and energy that must be sustained for many years to come.

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Appendix A. Research questions.

Individual programme participants

1.1 Does participation in the Big Noise orchestra have an impact on the confidence, wellbeing and social development of programme participants? MM, ST, MT

1.2 Does participation in the Big Noise orchestra have an impact on programme participants' self-esteem, self worth and future aspirations? QL, ST

1.3 Does participation in the Big Noise orchestra have an impact on school discipline, academic attendance, performance and attainment? MM, ST, LT

1.4 Does participation in the Big Noise orchestra have an impact on post-schooling destinations? QT, MT

1.5 Does participation in the Big Noise orchestra have an impact on language acquisition in children where English is their second language? MM, ST, MT

1.6 Does participation in the Big Noise orchestra have an impact on the participants' contact with the justice system, welfare system and with health and social care services? QT, LT

1.7 Does participation in the Big Noise orchestra have an impact on the morbidity, mortality and healthy life expectancy of participants? QT, LT

Family of programme participants

1.8 Does participation in the Big Noise orchestra have an impact on family social capital including quality of parent/child relations; adults' interest in children and parental discipline and monitoring? QL, ST

1.9 Does participation in the Big Noise orchestra have an impact on familial self-esteem, self-worth and aspirations? QL, ST

Community

1.10 Does the delivery of the Big Noise programme enhance community social capital: social support networks; civic engagement; trust and safety; perceived quality of neighbourhood? MM, ST, MT, LT

Societal/regional

1.11 What are the 'true' costs of the Big Noise interventions; including capital, staffing, operational and consumables, taking into account in-kind contributions and opportunity costs? QT, ST

1.12 What are the costs per unit of benefit and what are the long-term returns on investment in Big Noise programmes? QT, LT

Evaluation aim two: To gain insight into Sistema Scotland's ethos and vision, their approaches to selecting programme sites, adapting programme delivery to local structures and requirements, local partnership working and the characteristics of the staff and implementation which are critical to enhancing inclusion, engagement and retention and achieving positive outcomes for the individual, family and community.

Methods key: QT = quantitative methods; QL = qualitative methods; MM = mixed methods.
Timescale key: ST = short term; MT = medium-term; LT = long term.

Programme delivery

2.1 What are the theorised causal pathways linking participation in the Big Noise to impacts on the outcomes of interest? What are the assumptions that underpin these causal pathways? QL, ST

2.2 Taking cognisance of the 2011 evaluation, what are the core principles and characteristics of the Big Noise programme delivery? How have these been applied in moving from Raploch to Govanhill? To what degree are these principles and characteristics generalisable, replicable or up-scalable? QL, ST

2.3 What are the key challenges in the delivery of the Big Noise programme? And what steps can be taken to overcome these challenges? QL, ST

2.4 Which skills, characteristics and values are deemed important when recruiting a Big Noise musician? QL, ST

2.5 How does Sistema Scotland approach staff development? QL, ST

2.6 How does the Big Noise work with families with multiple issues and children with very challenging behaviour? QL, ST

Organisational characteristics

2.7 What are Sistema Scotland's core values? What ethos does the organisation aim to create and in what ways do the values and ethos infuse the delivery of the Big Noise programmes? QL, ST

2.8 What are Sistema Scotland's governance arrangements? QL, ST

2.9 What is Sistema Scotland's funding strategy and how do they approach sustainability? QL, ST

2.10 What is Sistema Scotland's growth strategy and with what criteria does the organisation assess whether a community represents a 'good fit' to become a Big Noise programme site? QL, ST

2.11 How does Sistema Scotland ensure and measure the quality of Big Noise programme delivery internally? QL, ST

2.12 How does Sistema Scotland view the role of the community within the development, delivery and monitoring of the Big Noise programmes? QL, ST

Engagement and Partnership working

2.13 How does Sistema Scotland go about engaging (and retaining) local and national partners, programme site schools, the wider community, families and child participants? QL, ST

Appendix B. Proposed quantitative, linked, routine data set for long-term tracking of individual programme participants.

Category	Proposed data item	Possible location	Type of data
Demographic	Child participant's name	Local Authority (Education)	All eligible children
Demographic	Child participant's date of birth	Local Authority (Education)	**/**/****
Demographic	Child participant's ethnicity	Local Authority (Education)	Country of origin
Demographic	Child participant's gender	Local Authority (Education)	M/F
Demographic	Child participant's postcode	Local Authority (Education)	**** ***
Demographic	Child participant's SIMD info	Local Authority (Education)	Postcode info to link – deciles, quintiles and breakdown of aggregated data
Demographic	Learning/disability	Local Authority (Education)	Disability, yes/no
Demographic	Learning/disability	Local Authority (Education)	Nature of disability, LA to advise categories
Demographic	Housing	Local Authority/Social Housing Associations	Housing tenure (to be confirmed)
Programme	Marker of Sistema 'engager'	Big Noise	Yes/no
Programme	Classes attending	Big Noise	Categories – instrument, in-school, after-school, holiday
Programme	Hours per week attendance (average)	Big Noise	Average number of hours per week
Programme	Performance	Big Noise	Categories of conduct, concentration, aptitude, attitude etc
Programme	Milestones	Big Noise	Categories – performances, attendance at residential trips etc
Educational	Looked after children	Local Authority (Education)	Yes/no
Educational	Exclusion/behavioural	Local Authority	Yes/no

	issues	(Education)	
Educational	Exclusion/behavioural issues	Local Authority (Education)	Number of exclusions to date
Educational	Exclusion/behavioural issues	Local Authority (Education)	Marker of aggression, violence, conduct disorders, disobedience, anxiety, depression
Educational	School attendance	Local Authority (Education)	% attendance
Educational	School attainment	Local Authority (Education)	Standard grades, Highers, testing, Local Authority to confirm categories
Educational	School performance	Local Authority (Education)	General marker of conduct, concentration and attitude
Educational	Post-school destination	Local Authority (Education)	Categories – Employment/Unemployed/Benefits/Further Education
Educational	Language acquisition (ESOL)	Local Authority (Education)	Language acquisition for ESOL child, categories of acquisition
Educational	Social development	Local Authority (Education)	To be confirmed
Health behaviours	Smoking status	NHS Health Board, GP	Yes/no, count of current smokers
Health behaviours	Alcohol/drugs misuse	NHS Health Board, GP	Yes/no, count of alcohol/drug misuse
Health behaviours	Teenage pregnancy	NHS Health Board, GP	Yes/no, count of teenage pregnancy
Health Outcomes	Obesity	NHS, ISD	Child BMI
Health outcomes	Morbidity – chronic disease	NHS, ISD	Yes/no
Health outcomes	Morbidity – chronic disease	NHS, ISD	Disease type
Health outcomes	Morbidity – chronic disease	NHS, ISD	Age of disease onset
Health outcomes	Mortality	NHS, ISD	Yes – 'dead'/no – 'alive'

Health outcomes	Mortality	NHS, ISD	If yes, age of death
Health outcomes	Mortality	NHS, ISD	If yes, disease type attributed to death
Health services	Contact with GP	NHS Health Board, GP	Count of contact with GP to date
Health services	Contact with GP	NHS Health Board, GP	Category of contact
Health services	Accident & Emergency	NHS Health Board	Count of A&E admission
Social services	Contact with social services	Local Authority	Yes/no marker (child/family 'are known' to Social Services) (to be confirmed)
Social services	Contact with social services	Local Authority	Nature of contact (to be confirmed)
Social services	Contact with social services	Local Authority	Count of contact to date (to be confirmed)
Justice system	Contact with Justice system	Justice System (explore)	Yes/no – general contact (to be confirmed)
Justice system	Contact with Justice system	Justice System (explore)	Yes/no – incarceration (to be confirmed)
Justice system	Contact with Justice system	Justice System (explore)	Incarceration (months to date) (to be confirmed)
Justice system	Contact with Justice system	Justice System (explore)	Nature of criminality (to be confirmed)
Welfare system	Welfare claimant	Department of Work and Pensions	Yes/no – general claimant (to be confirmed)
Welfare system	Welfare claimant	Department of Work and Pensions	Nature of welfare use, duration (to be confirmed)

Appendix C. Economic evaluation of Sistema Scotland.

The economic evaluation of Sistema Scotland would be aimed at (a) estimating the resource implications (expressed as costs) of Sistema as an 'intervention' and (b) linking net resource implications to outcomes achieved in aiding judgement about the overall 'value' of the programme.

Costing Sistema

The costing of Sistema would have two main stages: estimation and costing of the main resource inputs into provision of the programme itself; and estimation and costing of any subsequent resource implications attributed to Sistema.

On the first of these, programme costs would usually be divided into three main categories:

- Capital items, such as space used for tuition, practise and performances, and equipment, such as instruments and other items.
- Staffing costs associated with Sistema, buddies and Council Directorates (e.g. education, social work, community and culture), including important stages such as induction and training.
- Operational and consumable items (e.g. travel costs).

On the face of it, it may seem that many of the above resource items are 'free'. Although this may be true in the financial sense (e.g. due to not being charged for space or voluntary inputs), such resources may still have opportunity costs in the sense of having other uses. Also, in thinking about generalisability, it may not be that all such resources would remain financially-free in all subsequent jurisdictions in which Sistema might be implemented. Therefore, it is important at least to document the amounts of different types of resource required, with monetary estimations merely being a way of representing such resource use in a common unit of account. Judgements about whether the use of any particular resource item does indeed have an opportunity cost can be made subsequently in costing out different scenarios in a sensitivity analysis (e.g. space used in a community hall might be judged to have little or no opportunity cost because the hall would have had no competing use during the times it was used).

On the second issue of resource implications we would aim, from survey data collected within the main study and from the literature, to identify an attributable rate of reduction in costs of things like truancies, school exclusions, employability support and even offending. To inform our activities here, the research team might also be able to come up with a menu of future resource items which they would see as potentially saved by Sistema, and also some areas of service provision which might be increased through engagement with Sistema. If we get as far as being able to cost out such resource implications, we may also have to make some assumptions about degrees to which attribution levels would be sustained over time.

Linking costs to outcomes

From our reading so far, it seems that the study might be able to say something about various outcomes such as confidence, skills, happiness, discipline, school attendance and attainment, aspirations and resilience. If all such outcomes were to point in a positive direction and the work on resource impacts were to show likely overall cost savings, this would present a powerful case for continuation and expansion of Sistema.

If there were net cost increases accompanying positive outcomes, then at least we will know the magnitude of resource increases required to achieve such outcomes. Beyond this, it may also be possible to relate the above listed outcomes to longer-term gains in health and wellbeing, and an attempt could be made to do this in ways informed by the current logic model.

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Appendix D. Sistema Scotland Evaluation Advisory Group membership.

Angiolina Foster CBE (chair)	Healthcare Improvement Scotland
Aileen Campbell	Audit Scotland
Antony Clark	Audit Scotland
Patricia Watson	Education Scotland
Carol Tannahill	GCPH
Chris Harkins	GCPH
Lisa Garnham	GCPH
Cam Donaldson	Glasgow Caledonian University
Clementine Hill O'Connor	Glasgow Caledonian University
Helen Mason	Glasgow Caledonian University
Marissa Collins	Glasgow Caledonian University
Michelle McClung	Glasgow City Council
Julie Truman	NHS Greater Glasgow & Clyde
Laura Turney	Scottish Government
Nicola Killean	Sistema Scotland
David Leng	Stirling Council
Helen Sweeting	University of Glasgow
Louise Marryat	University of Glasgow

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