

PE1591/O

Petitioner Letter of 8 December 2016

In our further submission attached to this letter we provide a detailed critique of what is wrong with the option appraisal conducted by NHS Highland (NHSH) but yet so far approved as part of the Initial Agreement by the Cabinet Secretary for Health. This critique has been produced by Professor Ronald MacDonald who has had experience of working on options appraisals at the very highest levels of national governments and public bodies all over the world. He concludes that **lives are currently at stake because of the ill advised removal of Accident and Emergency care in Portree and that more lives will be at stake, over and above that expected in a normal population, if the proposal to site the new hospital in Broadford goes ahead as part of the redesign.**

It is unfortunate, to say the least, that the Cabinet Secretary in her letter of 31 October (PE1591/N) has yet again failed to address the substantive issues brought to her in our submission of September 17 (PE1591/J). In her response Ms Robson says that the decision to place the hub in Broadford was based on 'available evidence'. As we have pointed out and re-emphasise here in considerable detail, NHSH in their locational optional appraisal have been selective in their choice of benefits in deciding their chosen location, have ignored any of the costs and associated risks and have failed to quantify any of the quantifiable data. They are in breach of the Treasury Green Book, and the Scottish Capital Investment Manual(SCIM), a mandatory document for public sector capital investment. Given this we request that the Cabinet Secretary clarify in what way the Scottish Government's Capital Investment Group found the NHSH location option appraisal to be 'very good', if that is indeed what she was referring to.

In further justification of her failure to answer objective and substantive questions and issues, the Cabinet Secretary in her letter again resorts to repeating the outcome of a survey conducted by NHSH, which was undertaken after both the model and location options appraisals had been completed. NHSH insist that they had to consult on the preferred option which may be the case but it makes a nonsense of them 'consulting' the community on their preferences thereafter.

Following publicity about the preferred option the survey had a very low turnout of 19% overall (2,273), with a response rate of 13.5% in Skye Central and 13.6% in Skye North. Unbelievably the only options for siting the new hospital in the survey were four sites in Broadford! No sites were given in the Portree area. We remain astonished that NHSH and the Cabinet Secretary consider this oft quoted survey robust enough to genuinely represent public opinion in Skye and Lochalsh (the South West Ross response rate was 9%). Would any democratically minded person pay heed to a poll where you can vote for option A against B but only variants of option B are actually available? None of the MSPs would have a seat in the Scottish Parliament under this version of democracy! Perhaps from this the Committee will begin to see just what the people of Skye have been up against with respect to the so-called 'consultation' carried out by NHS Highland. If any democratic organization were to conduct such a one sided poll they would be ridiculed and that is why over

4,500 people have signed a petition expressing the completely opposite view from that claimed by NHSH and repeated by the Cabinet Secretary.

In her response of 31 October to the Committee the Cabinet Secretary goes on to say: *'...I have little doubt that the Health Board would have been faced with similar and significant opposition from the communities around Broadford, the South of Skye, had the preferred option been to build the new hospital in Portree.'* We have little doubt that would have been the case but that of course does not address the key issue we are concerned about, namely that NHSH are planning to put a significant number of lives at risk unnecessarily and place an unnecessary additional economic burden on the community in breach of both UK and Scottish Government guidelines with respect to their locational decision due to having ignored key **objective** indicators in their decision making. SOSNHS Skye has never been about North vs South issues but about saving lives that will be lost unnecessarily by the wrong decision being made and avoiding the other implications of a wrongly made decision, due to a failure to follow mandatory Government procedures.

With regard to the Scottish Ambulance Service (SAS) response to the Committee of 28 October 2016 (PE1591/M) it is important to note that however efficient the planned ambulance service is for Skye it can never compensate for an ill-designed system which ignores the key determinants of hospital location. If the new hospital is to be based in Broadford the SAS will locate the main ambulance base there, away from the main population centre where needs and risks are greatest. What would be the use of having the main ambulance base in Broadford if there was, for example, an explosion in one of the oil tanks in Portree which affected the many thousands of locals and tourists within its path? The absence of an A+E and hospital beds in Portree would be critical factors in determining who lived or not as a result of such a major incident. Given the recent major oil spill in Portree this is not an impossible scenario. But the probability of a major incident is of no concern to NHS Highland since this was not factored into their options appraisal!

We again therefore seek **urgent answers from the Scottish Government** to the legitimate questions raised here and in previous submissions and not just repetition of previous positions. Crucially, we believe until proper recognition is given to objective facts that should underlie hospital location in this area – facts such as relative population sizes, relative needs, costs and risk assessments in the proposed locations – lives are at stake in this community especially in the planned absence of hospital beds and A and E in Portree.

Summary of Key Issues and Questions for the Cabinet Secretary for Health

1. Why is the Health Secretary prepared to sign off on a design statement on the location of a hub and spoke model which is clearly in breach of mandatory guidelines stipulated in the Scottish Capital Investment Manual? The NHSH location options appraisal cannot be assessed to maximize benefits since it completely avoids any assessment of costs or risks. A raft of factors which should have been included in the options appraisal have been omitted. These have an important bearing on the number of lives potentially saved over the life of the new hospital. Omissions include the failure to capture population differentials between Portree and Broadford which are substantial and will

have a dramatic effect on the demand need for emergency services both now and over the 60 year life of the hospital.

2. Why have a set of critical risk factors that exist in Portree but nowhere else in the area been ignored when they are so material to hospital location? These include the possibility of road closure between Broadford and Portree and the possibility of a major incident in the main population, tourist, employment and education centre in the area.
3. Does the Cabinet Secretary realize she has signed off on a location for the new hub hospital that has an associated higher probability of loss of life over the projected life of the project? This follows from relative current and projected population profiles, and relative drive times with respect to the Golden Hour.
4. There will be important and significant economic consequences for individuals in Portree (be they resident, tourist or in employment there), the north of the island and Scotland which have not been costed and which should be, at full economic cost, according to the Treasury Green Book and the SCIM. If the hub is to be located in Broadford is the Scottish Government prepared to pay these costs, on an annual basis, to the residents who will be disadvantaged?
5. Is the Cabinet Secretary not concerned about further disadvantaging those living in the most deprived sectors in the area, most of which are concentrated in the Portree area and north of the island? National guidance on public spending is clear that this, along with other distributional effects related to age for example, should be a key consideration in options appraisal, and there is no evidence that NHSH has assessed such effects.
6. Who is going to pay for the wider social and environmental impacts of the wrong locational decision, which have not been assessed in the choice of location?

Professor MacDonald and others from SOSNHS Skye would be more than happy to appear before the Committee to further detail their concerns, or to engage in discussion with anyone from the Scottish Government involved in the approval of NHS Highland's Initial Agreement. We believe this petition to be of national significance. At its heart is trust that the Scottish Parliament wishes to ensure decisions on spending public money should be based on objective assessment of net benefit to the community, and not on flawed and preconceived notions of any one interest group.

Your Life in their Hands

**Are the proposed health care changes in Skye, Lochalsh and South West Ross
being determined by little more than the toss of a coin?**

NHS Highland's Locational Options Appraisal Revisited

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¹ I would like to thank the following colleagues for helpful comments and input on this paper and on previous drafts: Colin Boden, Ross Cowie (Lucky2BHere), Neil Ferguson, Dr Catriona MacDonald, Alan MacRae, Sarah Marshall, Reverend John Murray, Neilian Murray, Jane Robertson, John Robertson and Professor Martin Waller. Any remaining errors of omission or commission are the responsibility of the author.

Executive Summary

1. This paper re-examines the case made by NHS Highland (NHSH) for the redesign of hospital services in Skye, Lochalsh and South West Ross (SLSWR) and demonstrates that the use of a **deeply flawed location options appraisal analysis** has led to the wrong choice on location of the new hospital, with very serious implications for public safety and wider economic and social costs.
2. The design statement described in NHSH's Initial Agreement fails to demonstrate that it will provide the greatest benefits to society, and that funds will be spent in the most efficient manner, and is therefore **in breach of the Scottish Capital Investment Manual (SCIM), a mandatory document for this type of exercise and also the Treasury Green Book.**
3. For a variety of reasons, siting the new hub hospital in Broadford, away from the main population, tourist, education and employment centre, will lead to a **much higher probability of unnecessary loss of life** over the 60 year projected life of the project.
4. Amongst the litany of omissions from the locational options appraisal and which NHSH had a mandatory obligation to include are:
 - Both the 60 minute – the so-called 'Golden Hour' – and 30 minute drive times to Broadford and Portree both favour Portree, and dramatically so, when adjustment to these figures are made for population differentials and population projections (see 3.7)
 - No account is made for the stark population differential between Portree and Broadford, and the North and rest of the area in terms of the higher risk of an emergency in the more populous area and the consequences this has for survival rates. (see 3.2-3.4)
 - Placing the hospital away from the main population and employment centre places an additional huge burden on the community in terms of increased time off work and increased travel time. All of this is required to be costed at full economic cost according to the SCIM but this has been ignored by NHSH. Is Scottish Government prepared to pay these costs that will run to hundreds of thousands of pounds per annum. If not who will? (3.3)
 - Although SLSWR are fortunate to have the most dedicated ambulance crews in the country, no ambulance service however well resourced can compare with having an A and E in the most populous centre. Indeed, the current proposal to base the ambulance service in Broadford runs counter to the key Golden Hour and half hour metrics for saving lives! (3.7)
 - No account has been taken of the implications of the Portree population doubling over the life of the project while the rest of the area grows at a fraction of the Portree rate or even negatively (see 3.4).
 - No allowance has been made for the distributional consequences of the proposal in terms of deprivation indicators and care of the elderly (see 3.9).
 - No account has been taken of the fact that Portree is the main employment centre in the area with a risk profile that is similar to many

urban areas; no other part of the area has a comparable risk profile (3.5);

- A major oil depot is situated in the centre of Portree and is serviced daily on inadequate roads by many oil tankers; no risk assessment of this facility was factored into the options appraisal (see 3.5);
 - Under current proposals if the A87 is blocked between Sligachan and Broadford the whole of the most populous part of the area, along with a large cohort of tourists, would have no access to an A and E service; the siting of the hospital in Portree would not have the same risk for the rest of the area (see 3.6). This is ignored in the NHSH location appraisal.
 - No account has been taken of the fact that Portree is a major lifeboat centre providing an emergency service not only to those at sea but also for the Isle of Raasay an important factor given the withdrawal of emergency cover for that area by NHSH (3.8)
 - No account has been taken of the implications for the environment and wider economy, despite mandatory regulations saying they should be (3.10)
 - The flawed location options appraisal conducted by NHSH only favours Broadford by a slender margin (49 points out of 766, or 16 out of 766 if a sunk cost term is removed). It is our contention that no responsible organisation should proceed with a 60 year investment on the basis of such a slender margin given the many lives that are unnecessarily being put at risk and given that the inclusion of any single omission noted above would turn the location decision around in Portree's favour. This is especially important since NHSH had a mandatory duty to consider all of the above omissions but it has hitherto failed so to do.
5. Despite the deeply flawed nature of the locational study, NHSH have withdrawn the Accident and Emergency (A and E) service from Portree, which has been in place for over 50 years, with no objective analysis to support their decision.
 6. It is a recommendation of this paper that the A and E service in Portree is immediately reinstated before any lives are unnecessarily lost for the objective reasons clearly articulated.
 7. The second key recommendation of this paper is that if the location of the new hospital for SLSWR is based on objective evidence, using mandatory Government guidelines, it should be built in Portree. This is the only location in the whole of SLSWR that the net benefits of a £15million spend are clearly and unambiguously maximised. This equates to the maximum number of lives being saved over the life of the project.

1 INTRODUCTION

1.1 Major redesign will be an opportunity missed for generations

The major redesign of health services in Skye, Lochalsh and South West Ross offers NHS Highland (NHS) a clean sheet to look at all the factors that they are mandatorily required to and offer community and hospital services that will be fit for purpose for the present and the next 60 years. While the opportunity to have access to updated and appropriate health services is warmly welcomed by the community, there are considerable concerns as to the implications of the current proposals for access to both community and hospital care. We assert that NHS are in clear breach of mandatory guidelines in terms of their decision to site the new hospital in Broadford on the Isle of Skye. We contend that this results not only in significant increased costs to this community, but also most worryingly in an increased and unnecessary risk to life which could be very large indeed given the extant risk and population profiles.

1.2 Recent submissions to the Public Petitions Committee

Concerns about the incomplete nature of the location options appraisal carried out by NHS have already been submitted to the Scottish Public Petitions Committee on 17 September 2016 and 7 October 2016 (PE1591/J and PE1591/L). Hitherto there has been no objective or substantive response to these submissions from either NHS Highland or the Scottish Government. NHS's response is to say that they will consider the issues raised at the business plan stage. However clearly since the location issue has already been decided that statement is simply a red herring. They further argue that Highland Council and HIE have offered their support. However, despite our request no evidence has been presented that either of these organisations considered the location options appraisal in a rigorous manner.

The only response to date from the Cabinet Secretary for Health is to say that the Capital Investment Group has indicated the options appraisal (singular) is 'very good'. However, there are two options appraisals of relevance— one on the new service model and one on location – and taken in totality these options appraisals have a number of glaring omissions according to both the Treasury Green Book and the Scottish Government Capital Investment Group Manual (SCIM).

The locational options appraisal conducted by NHS is deeply flawed and is in clear breach of the Treasury Green Book, the adopted guidelines used by Scottish Government, and the Scottish Government Capital Investment Group Manual, a mandatory document.

The model options appraisal has been conducted in line with the SCIM and Green Book guidelines as it considers both quantifiable and non-quantifiable costs and benefits and also the risks relating to model choice. Additionally, a Net Present Value (NPV) framework is used for the 60 year life of the project. The hub and spoke model has been widely accepted in the SLSWR community as the way forward although concerns remain about provision within the hub and spoke.

In contrast to the model options appraisal, the locations option appraisal is at variance with both the SCIM and Green Book as it ignores any of the costs and all of the risks (non-model) associated with locational choice. It ignores quantification of any of the costs or benefits which exist and only focuses on a

limited set of non-financial benefits. Furthermore, it ignores important factors such as the distributional impacts of location choice and the implications for the economy and environment. NHSH were required to consider all benefits and costs in their decision making since only by so doing can they say anything valid about optimal resource allocation and whether the locational decision offers best value, provides the maximum benefits to the community and ultimately save the maximum number of lives over the 60 year horizon of the project.

Doubtless many of the worrying issues here arise because in every other instance of which we are aware, for similar sized population densities and risk profiles, NHSH has always placed its hub hospital in the most densely populated town with scant regard for geographic centrality, as have other Health Boards. As we shall demonstrate, placing the hospital in the main centre immediately removes the greater loss of life issue and internalizes the other issues noted above. **The placing of a hospital away from the main population centre will always lead to a sub optimal allocation of resources and therefore breaks the key rule of optimal resource allocation that a new build hospital should lead to the maximum welfare for the greatest number of people at the most efficient cost.**

1.3 Economic skills are required in options appraisal

It is noteworthy that the manual adopted by the Scottish Government to ensure that public sector groups achieve best value and maximise net benefits in their investment decisions is written by economists and signed off by the Chief Economist to the Treasury. The SCIM is based on the Green Book and defers to it. We must presume therefore that the person or persons who undertook the locational options appraisal on behalf of NHSH is/are suitably qualified to use these manuals.

In order to avoid misconceptions and misperceptions that seem to have arisen as to why an economist should be involved in the decision regarding the location of a hospital in SLWR, it is worth defining up front what economics as a discipline is about. The Nobel Laureate Paul Samuelson and William Nordhaus define this succinctly in their well known level one Economics text book:

Economics is the study of how societies use scarce resources to produce valuable commodities and services and distribute them among different people. Behind this definition are two key ideas in economics: that goods are scarce and that society must use its resources efficiently.

In sum, the latter means that resources should be used in an efficient way so that the net benefits to society of a resource allocation exercise should be maximised

Economics deals with both microeconomic issues – the allocation of resources at the local level, such as a new hospital or other private or public service - and macroeconomic issues relating to the whole economy such as finance, recessions, and banking. A focus on the latter often leads to the misconception in the eyes of the uninitiated that economics is all about money, the stock market and ‘financial costs’. Although financial costs are often considered by economists, they are not the relevant cost measure that economists use in an options appraisal, which is **opportunity cost**. The Scottish Capital Investment Manual (SCIM) defines

opportunity cost: *The opportunity cost of using a resource is its value in its next best alternative use. An emphasis on opportunities foregone is central to the way of thinking that underpins all the costing in an economic appraisal'*

In essence it is the failure by NHSH to properly address the opportunity cost of putting the main hospital for the area in Broadford that has led them to the wrong decision. Indeed, in their written and oral statements members of NHSH have indicated that because their locational options appraisal is not about 'financial costs' that they can ignore any inclusion of costs in the exercise. This is simply wrong and shows a profound misunderstanding of the options appraisal process and the concept of the maximising of net benefits.

The author of this paper is an economist who is consistently ranked in the top 1 per cent of economists in the world and has led numerous high level options appraisals for governments, such as the Planning Authority of Qatar, and international agencies such as the European Commission and the International Monetary Fund.

1.4 Recent changes in population and tourism

It is now widely recognized that the Isle of Skye is the number two tourist destination in Scotland, with approximately half a million tourists visiting the island each year. The majority of these stay in and around Portree, the island capital, and the north of the Island. This makes the north of the island by far the most densely populated area in the area by about 5,000 for a large part of the year. The main tourist season on Skye now extends from March to November with Portree itself having an all year-round additional population cohort.

The population of Portree at least doubles for much of the year due to this influx and this combined with tourists in the north of Skye makes this the main population centre in the whole area, including South West Ross, and by a wide margin. Portree is also the largest employment and education centre for the whole area adding at least a further 1,000 people a day and making it a substantial urban settlement. Portree currently has one of the highest population growth rates in the Highlands (1.2% per annum), at a time when other areas are registering much smaller or even negative growth rates. As a thriving town with a wide diversity of employment activity it also features many of the risks associated with other urban areas.

1.5 Hospitals on the Isle of Skye

Historically the main hospital on Skye and Lochalsh has been located in Broadford with a secondary hospital in Portree. Broadford has been the main hospital in the area for historic reasons when hospitals were funded by private sector fundraising and major donations were made in the Broadford area to create the Dr MacKinnon Memorial Hospital in the 1930s. Since then, there seems to be an ingrained belief amongst local health providers that this decision is immutable.

Until recently, both hospitals had an A and E. This service has now been withdrawn from Portree with no credible analysis to back up the decision. Portree Hospital has 12 beds, although one ward is currently closed due to staff shortages, and X- Ray

facilities, and this will close as an inpatient hospital as part of the redesign.² This paper shows that the withdrawal of an A and E service from Portree is a serious mistake as a properly conducted options appraisal would have shown that the area is urgently in need of one now given the population densities, risk factors and other criteria which have gone unaddressed in the locational study.

1.6 Addition of South West Ross (SWR) to the catchment area

At the start of the current discussion for a new hospital, NHSH included South West Ross in the catchment area for the new hospital. NHSH were keen to do this because it makes Broadford the geographic centre of the whole area and brings a population counterpart to the greater population density in north and central Skye. This then allows them to argue that locating the new hospital in Broadford dovetails with their patient flow concept (see below), the central plank of NHSH's argument for retaining Broadford as the main hospital.

However, the inclusion of the SWR area is simply a red herring, as in reality the bed usage of Skye hospitals from this area has been historically very small (90 per cent of South West Ross bed occupancy days are in Raigmore Hospital) and Broadford is also almost never used as the acute centre for SWR residents - close to 80% of 999 calls on Skye are from postcodes that have Portree as their nearest hospital.

2 NHSH location options appraisal will not achieve the maximum benefits from public spending

2.1 National guidance

The spending of public money has to be undertaken with due regard to optimizing the benefits of public spending in an efficient way and in a manner that is transparent and consistent. As the Treasury Green Book notes in its introduction, appropriate evaluation methods should be applied to public sector expenditure to ensure **'that public funds are spent on activities that provide the greatest benefits to society, and that they are spent in the most efficient way'**.

Few could argue with this statement, nor with the methods outlined in great detail in the Green Book for achieving such an optimum. This has been adopted by the Scottish Government for public spending decisions and underpins the Scottish Public Finance Manual and the Scottish Capital Investment Manual (SCIM). The latter's guidelines are mandatory for capital investment projects in the NHS where clearly making the wrong decision not only has implications for the allocation of public funds but also potentially the lives of members of society.

How is this to be achieved?

Treasury Green Book 5.1. The relevant costs and benefits to **government and society** of all options should be valued, and the net benefits or costs calculated. The decision maker can then compare the results between options to help select the best.

² NHSH are in something of denial as to whether an A and E actually existed in Portree. However, a letter of 13 April signed by the partners of the Portree Medical Centre confirms that there has been an A and E service in Portree for 50 years as everyone who has lives here, and especially those whose lives were saved by having the said A and E, know full well.

Scottish Capital Investment Manual 3.1 The relevant **base case costs and benefits to government and society of all options should be valued**, and the net benefits or costs calculated. Relevant costs and benefits are those that will be affected by the decision at hand.

Scottish Public Finance Manual: also neatly summarises the importance of taking account of risk factors in an option appraisal, and the analysis of risk is dealt with at length in both the SCIM and the Green Book.

For each option, the impact of **all** relevant factors and **related risks and uncertainties** should be set out **systematically** and an assessment made of where the **balance of advantage lies**. The Green Book gives more detailed guidance and points to other sources which can help, for example, to deal with risk and uncertainty, and with costs and benefits not easily valued, such as environmental effects.

In any options appraisal the first best policy is always to attempt to quantify the costs and benefits in monetary terms. For costs and benefits that cannot be quantified a non-monetary approach is permitted, such as a multiple criteria analysis (MCA), but the pitfalls in using the latter are well known especially regarding the design of the underlying sample used and the use of an MCA approach does not preclude appropriate costs and benefits being quantified nor does it offer leeway for excluding other non-quantifiable costs and benefits, including risk factors.

Since we have observed a misunderstanding from NHS Scotland regarding the role of the Scottish Health Council's role in the options appraisal process it is worth noting here that in 2010 the Scottish Government issued a practice note stating inter alia:

*The Scottish Health Council does not comment on clinical or financial issues; **the adequacy of Board compliance with the technical requirements laid out in The Green Book option appraisal process**; or the effectiveness of a Board's engagement with its own staff.*

Scottish Government Practice Note CEL 4 (2010) 10 February 2010 para 14

2.2 Failure to assess and include costs

As the mandatory guidelines noted above demonstrate, maximising the benefits to society of a particular expenditure is achieved by assessing **all** of the costs and benefits of the project. The location option appraisal reported by NHS Scotland makes no attempt to quantify any of the relevant costs or benefits, despite their being extant quantifiable costs and benefits, which SCIM indicates should be quantified, and relies on assessing certain 'non-financial' benefits using a weighted scoring method (see below). SCIM indicates that even within such an approach that '**Costs and benefits** should be quantified in suitable....units' and that all non-quantifiable impacts, such as **environmental, social, health and risk factors should be included in such a study. Only a subset of these factors have been included by NHS Scotland in their options appraisal and those that have clearly favour Broadford** (see below). Since no costs of any sort enter into the location calculation, since no risks or further benefits have been included and since no heed is paid to environmental or distributional aspects it is immediately clear that the NHS Scotland location

options appraisal document can say nothing about maximizing the net benefits to the local community and beyond, the key criterion for the allocation of public funds!

2.3 Undue weight given to patient flow

The reason that NHHSH have chosen a 'non-financial' approach is because they consider the predominant benefit of the new hospital location to be one of patient flow (that is the ability to get patients stabilized in Broadford so they may then journey on to Raigmore if necessary). Their focus on this criterion seems to strain logic to its limits for two key reasons. First, those patients living south of Broadford – in Sleat, Lochalsh and South West Ross - will be moving in the wrong direction for the flow concept to work. Second, for the most populous area, in the north of Skye, for the flow model to work it obviously depends on getting people from the north to Broadford in time to stabilize them or stabilising them in an ambulance and there are fatal flaws in this argument as we note below.

2.4 Relative drive times not fully assessed and not included

The 30 and 60minute drive times calculated by NHHSH show the numbers of registered patients in the whole area who can get to either Broadford or Portree in 30 or 60 minutes for the whole area. Both favour Portree (see 3.7 below) and this is massively reinforced when a basic adjustment is made for the significant North - South population differentials. Although the ambulance staff in SLSWR are amongst the most dedicated in the country, ambulance response times are unknown and even if an ambulance could get to a patient on time, due to the policy of NHHSH, there is no guarantee that any given ambulance will have a paramedic on board, a crucial aspect of NHHSH's clinical pathways model. With an A and E in Portree, the most populous area on the island, everyone in the north of the area would have ready access to medical or paramedical help if they have a car or if they can find someone with a car and it is noteworthy Portree has an excellent range of taxi providers unmatched anywhere else in SLSWR.

All in the north of the island, including the large tourist population, would therefore have a much greater chance of getting to an A and E in Portree within the 60 minute Golden Hour even if all ambulances in the north were away on other business, which they are often required to do. The latter is a real possibility since if, for example, an ambulance with a paramedic on board is en-route to Inverness it will automatically be called into the pool of ambulances in the Inverness area when it arrives there and may not return to Skye for at least 24 hours.

2.5 Location appraisal results not statistically significant

The NHHSH location study asks members of the sample to give scores out of 10 to various criteria deemed relevant to the siting of the hub. These include patient flow to Inverness, demographic centre, geographic centre, travel time for visiting consultants, suitability of development of the spoke and the ease of acquisition of sites. Weights are given to each criterion and the weights are scored, then the scores are summed. The highest weight is given to the patient flow criterion, devised by one stakeholder group, the clinicians.

The outcome with the highest marks then becomes the chosen Hub. Broadford scores 766 to Portree's 717 for the hub location, a margin of 49. However, if the 'Ease of Acquisition' term is excluded, (which captures the fact that NHHSH have

already bought land in Broadford for the new hospital prior to the options appraisal which is a sunk cost and therefore should not have been included in such an appraisal) the margin is reduced to a slender 16, which would not be statistically significant. This is within a margin of error bound that should ring alarm bells for any responsible organization committing funds for the next 60 years. Considering the raft of omissions from the study, discussed below, one does not need to be an economist to very rapidly see that the slim margin in favour of Broadford will be massively eroded in favour of Portree as soon as these factors are taken into account.

2.6 Sampling issues and the inclusion of sunk costs.

It is well known that a key deficiency of the weighted scoring method is that the outcomes are highly sensitive to the sample chosen (see, for example, the Treasury Green Book). There are at least two issues here – the unbiasedness of the sample and the dominant group problem. The set up of the sample is crucial (as noted in my submission of 7 October 2016) to obtaining unbiased results. The NHSH location options appraisal skews the sample in two key ways against Portree as the hub.

First, there have been legitimate questions raised over the balance of the sample used in the locational study, in terms of giving equal representation to different areas, which NHSH refute. However, even if we accept the sample is balanced that is NOT the correct sample representation since it is supposed to be representation of the true population distribution; that is, in a statistical sense it should be unbiased if it is in any sense to be regarded as objective. As we have seen, the majority of people in SLSWR live in the north of Skye including Portree, and Portree has the highest scores for both 30 and 60minute drive times. Also, and as discussed elsewhere we know that by far the greatest use of emergency (999) calls is from the north of the island. It follows from this that just as the various criteria in the study have to be weighted so to do the people ranking the criteria. But equal weights have been used across the sample in this study and therefore the results cannot represent an unbiased outcome.

A second sampling issue relates to what may be referred to as the dominant group bias, where it is open for particularly strongly opinionated individuals or groups to dominate the sample and produce a biased outcome. For example, if there is an over representation of NHSH employees in the sample, then they are likely to bias the result in favour of their preferred option since the oft repeated opinion of NHSH is that the Hub hospital should be in Broadford and not Portree. The dominant group in the sample is indeed NHSH, with 9 of its own employees in the sample of 22.

In addition to the dominant group in the sample being NHSH employees there is no dedicated patient group in the study. SCIM guidelines indicate the importance of having a group of patients in such a study but that has not been done. NHSH response is to say is that everyone in the sample are potential patients. However, this misses the point entirely since it is patients that have used the facilities under scrutiny that are surely relevant here and there are many patients in the north of Skye who would not be alive today if they had not been able to have access to an A and E in Portree – they simply would not have been alive today if they had had to travel to Broadford. It is these patients that should have a say in a study of this kind and asked what difference the removal of an A and E facility over a period of 60

years is likely to make. Even if the location study had considered all of the costs and benefits it would still be of dubious value given it excludes patients, the ultimate users of the service, from the study.

A further issue with the locational options appraisal relates to the issue of 'sunk costs'. 'Costs of goods and services that have already been incurred and are irrevocable should be ignored in an appraisal. They are 'sunk costs'.' (The Green Book). The criterion 'The ease of access of acquisition' [of a hospital] site is one of the criteria used in the locational options appraisal since NHSH had already bought land in Broadford for the building of a new hospital prior to the options appraisal being conducted (which in and of itself must be regarded as a highly questionable use of public funds). However, this is a sunk cost and therefore this criterion should not have been used in the options appraisal. And it is interesting to note that the only sensitivity analysis of their modelling is one in which this criterion is dropped reducing the margin in favour of Broadford to only 16 points! Of course since the term should not have been included in the first place this means that no meaningful sensitivity analysis was applied to the results in the location appraisal, a further breach of mandatory guidelines.

3. Assessing the missing costs and benefits in the NHSH options appraisal.

In this section we describe and assess the missing information from the NHSH location options appraisal study.

3.1 Relative not absolute data should be used: differences between Broadford and Portree and their implications

In an options appraisal of this nature it is important to ask if the issue in question is an absolute one, in which case absolute data should be used, or if it is a relative comparison in which case relative data should be used. This is fundamental to any options appraisal. Since this is a *relative* comparison of Portree vs. Broadford relative data should be used. However, to the extent that NHSH do refer to data in any of their documentation it is always in absolute terms and no attempt is ever made to quantify relative data in the location study which, as the guidance notes, should be the first point of departure if such data are available.

Both SCIM and the Green Book make clear that any properly conducted options appraisal will contain assumptions about demand or need for the service and such demand or need will be based on demographics. Furthermore, both sources make clear that it is important to conduct a sensitivity analysis on such assumptions and other crucial factors). Nowhere in the location options appraisal can any assumptions be seen about such projections, far less any sensitivity analysis being undertaken. Yet there is ample data available to make such an analysis for the area under scrutiny as we now demonstrate.

3.2 Relative population size

The core population of Portree in 2015 was approximately 2500, around three times that of Broadford. The core population of Portree is not the same as the true population of Portree. Incredibly, despite the importance of tourism to the Scottish economy and to Skye we do not find in any of NHSH's assessments any reference to the inflated population of Skye due to its status as the number two tourist destination in Scotland after Edinburgh. (Note that Green Book makes clear that

options appraisals should take account of both government and society's needs.) Are NHS really saying they have no concern for this added cohort to the population which brings vital employment and revenue to the area along with expectations of appropriate medical care in an emergency (see below)? The majority of tourists who stay overnight on the island do so in the north further bolstering the population there and making it the dominant population cluster in the whole area.

The main destination centre on Skye – where people spend at least two to three hours a day – is its capital, Portree. The average number of people on any day of the week during March to November is 3,200 to 3,500 (approximately 500,000 visiting Portree per annum) the vast majority of whom stay for 24 hours, given Portree has by far the largest concentration of accommodation for tourists on the island in terms of B+B, hotel, and holiday rentals, plus the largest support sector in terms of restaurants and shops.

The daily population of Portree is further boosted by having the island's high school and its teachers, primary schools (both English and Gaelic) and a Centre of West Highland College, UHI, based there, raising the population by a further 1000. Additionally, a raft of businesses are located in the capital: the Highland Council have their main office in Portree along with the TECS services, Scottish Water and Scottish Power both have their main offices in Portree, there is a large hospitality sector comprising various hotels and restaurants, Skye Linen, Jans hardware, 3 garages and the island's main heavy goods vehicle testing station, 3 industrial estates, extensive fish farming operations in Loch Portree, the main refuse collection centre for the whole area and the prawn and pelagic fishing fleets.

We estimate that these daily activities add at least 1500 people to the Portree population total. So the true day-to-day population of Portree is approximately 7,500 compared to a population of around 1,000 in Broadford with similar adjustments. Given the tourist population in Portree now extends beyond the March to November horizon this should be regarded as a 24/7 population.

3.3 Implications of relative population sizes

Two important and significant factors follow on from the huge population differential between Portree and Broadford. First, other things equal in the much larger population we will obviously expect a much larger need for emergency services than the smaller sector and, given that the proposed A and E service is to be in the smaller population centre, along with the ambulance centre, it therefore follows that there will be a higher risk of people in the most populous area simply not reaching an A and E, especially given the vagaries of the ambulance service (see below). That is a statistical fact. This risk could be avoided clearly by having the A and E in the most populous area.

A significant cost missing from the location study conducted by NHS follows from the population differential. The drive time between Broadford and Portree is approximately 36 minutes in either direction. And given the population of Portree is up to 7 times that of Broadford this means that 7 x people will need to make the journey than would be necessary if the hospital was in Portree. Since Portree is the main employment centre the cost of time off work and the costs to the wider

economy will obviously be far greater if the hospital is in Broadford. NHSH are supposed to take these costs into account in their planning at full economic cost (which includes the person's salary, national insurance and pension costs, along with any travel costs) but they have not even considered this important cost, which could run into hundreds of thousands of pounds per annum. Who is going to pay these sums if the hospital hub is based in Broadford?

3.4 Relative population growth

The NHSH location options appraisal does not take account of the projected growth of population over the 60 year period of the redesign although the Green Book makes clear that 'demand risk' for a product or service has to be modeled over the life of the project. According to HIE figures the population of Portree is currently growing at 1.2% per annum and the rate of growth also appears to be increasing; the population of the rest of the area excluding Portree is growing at 0.4% per annum, one third that of Portree and, in contrast to Portree, this rate of growth appears to be decreasing over time. Interestingly population trends show negative growth rates for South West Ross and the Lochalsh area.

This means that over the course of the horizon that NHSH are using for the new hospital, **the core population of Portree is set to at least double**, (while the population of the rest of Skye grows by approximately one third of its current value) and therefore become a very significant population centre for the whole area even without the added tourist numbers and the added affect from being the main population centre. Tourist numbers have also been increasing steeply in recent years and if this trend continues it will widen the disparity over the life of the project even further and the risk of failing to get to A and E massively.

3.5 Work related risks

Clearly the relative population disparity between Portree and Broadford means that there is a far greater probability that someone is going to need an urgent admission than in a much smaller population location like Broadford. Furthermore, there are a number of key risk factors in Portree that do not exist or are relatively smaller in Broadford that increase the risk further by a significant extent and result in Portree being very similar in nature to a typical urban setting rather than the rural setting assumed by NHSH. There is as we have noted a considerable base of what could be termed light engineering jobs in Portree, along with the fish farming and fishing fleet, all of these bearing higher risk than the average risk in a rural area and much closer in risk terms to any urban area.

Perhaps the major risk factor in Portree relative to Broadford is the large oil storage facility that exists in Portree. This is a depot storing many thousands of gallons of highly flammable oil products and is regularly supplied by large oil tankers along a road which is clearly not fit for purpose. This depot is not built on an industrial estate but right in the heart of the village at the opposite side of The Lump to the hospital. The risk assessment for this depot shows that if there is an explosion it would be like a bomb going off in the centre of Portree that would affect the harbour area on that side of The Lump and all dwelling houses from there to the Cuillin Hills Hotel. Within the last two years there has been a large oil spill on the entrance road to the depot and a major incident was only averted by having a 24/7 fire service in place.

Clearly the harbour area is heavily populated by tourists and visitors throughout the year. The consequences of an incident there are almost unimaginable especially if there was no accident and emergency provision or hospital beds in Portree. This of course is not a remote probability accident since as noted within the last two years there has been a major oil spillage in this very area. But the risk remains and has not been considered in NHH plans. The emergency planning centre for the whole area is based in Portree, and the GP practice is the largest in the area, but there is no A and E to react rapidly to a major incident in Portree which is the most likely place for it to occur.

3.6 Impact of trunk road closure

The location options appraisal completely ignores the possibility of trunk road closure due to accidents or adverse weather that would result in zero A and E access for the population in the north if the hospital is placed in Broadford. For example, if there were to be a road blockage on the A87 between Broadford and Sligachan all of the north, including the many tourists based there, would be blocked from access to an A+E. This is clearly not a trivial point. With the huge influx of tourists to the island there are many accidents on this road and the road can often be blocked for this reason and, of course, NHH plans to force people from the main population centre to travel back and forth to Broadford can only exacerbate this. Police Scotland will always try to give access to an emergency vehicle in the case of a non-fatal accident. However, in the case of a road accident involving a fatality the road is closed to ALL traffic until the forensic examinations have been completed. During the last fatal accident on the Sligachan-Broadford Road the road was closed for a total of 8 hours! Of course there are other reasons, such as a landslips and other natural events that could also lead to a major closure of this road.

It is important to note that with no A and E in the north of the island the people there **have nowhere to go in the event of the above noted road closure on the A87**, which could well be a major incident in Portree involving multiple casualties. If the A and E is placed in the north of the island a blockage between Sligachan and Broadford would not be as devastating for residents in the south as they would always be able to get off the island and head for the nearest medical centre which could be reached in a much smaller time dimension than 8 hours. It is also noteworthy that residents in the north of the island have access to what are effectively two loop roads – the Sligachan–Dunevegan–Portree–Sligachan loop and the Portree–Uig–Staffin–Portree loop. If one leg of these loops is blocked due to an accident the majority of residents always have the option of reaching an A and E in Portree. This is a considerable benefit for the vast bulk of the area's population which has not been considered in NHH's plan for placing the hospital hub in Broadford for the next 60 years.

It is clear from this brief summary of population issues and risk factors that there is a hugely greater probability of people needing urgent A and E attention in Portree than in Broadford and therefore a potentially far greater loss of life by placing the Hub in Broadford rather than in Portree and no ambulance service however well provided (see 3.7) can compensate for that. But there are further omissions which make the current parlous state of health care in the north of the island even more serious as we move forward.

3.7 Drive times and the Golden Hour

At the heart of the community's concern about plans to locate the new hub hospital at a considerable distance along rural roads from the main population centre is the higher probability of loss of life. Although the direction of patient flow is considered highly significant by the location options appraisal group, **the length of time to get to hospital in an emergency is not included.** The widely recognized concept of the 'Golden Hour' does not seem important to NHSH but it is to members of this community who would rather get to a facility which they know they can reach in time to save their life rather than be taken on a flow trip to Inverness which they do not survive.

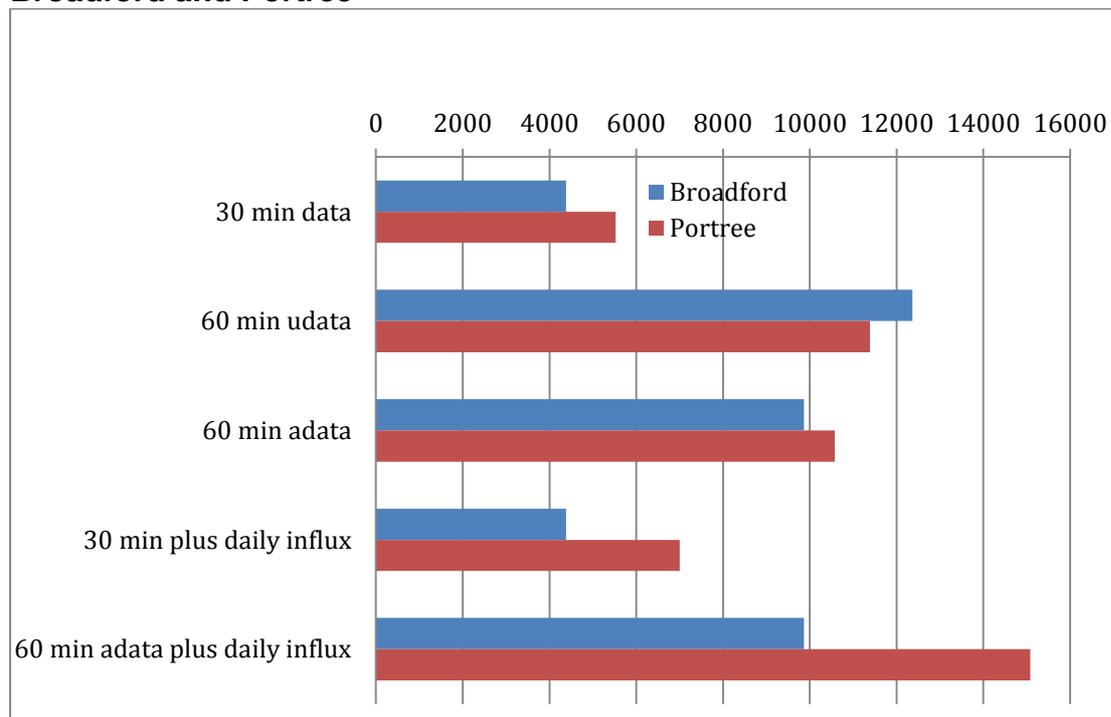
*'In emergency medicine, the **golden hour** (also known as **golden time**) refers to a time period lasting for one **hour**, or less, following traumatic injury being sustained by a casualty or **medical emergency**, during which there is the highest likelihood that prompt **medical** treatment will prevent death.'*(Wikipedia definition).

We understand that the Scottish Ambulance Service (SAS) does not have targets for response times in rural areas but it is surely significant that in more populated areas the target response time for life threatening incidents is 8 minutes, and 19 minutes for serious but not life threatening incidents. Portree of course is akin to an urban area in terms of the factors noted above and the many tourists who stay there for the bulk of the year who will surely expect these kind of response times if they were to become seriously ill. In this area therefore it is crucial that in the event of an ambulance without a paramedic not being immediately available, or no ambulance at all (both perfectly plausible outcomes given NHSH's design) which is very possible, that those in Portree and the north of the island can attempt to reach medical help as soon as possible. Travel times to the Hub for the bulk of the population are therefore of critical importance. Presumably the 3000 plus tourists who pay large sums of money into the hospitality sector in Portree, which has huge effects on the local economy and beyond, in terms of employment and revenue generated are entitled to expect, along with everyone else in the area, at least expect similar response times to other urban areas in the case of an emergency? Not so. Not so indeed to the nth degree!

There are currently 4 operational ambulances based on Skye and Lochalsh (two in the north of Skye, one in Broadford and one in Kyle) and one in Lochcarron. The proposed changes indicate that the main ambulance base will be in Broadford, which seems extraordinary since it means that any ambulance that has to travel from Broadford to Portree and back again will by definition have exceeded the Golden Hour in drive time! Although ambulances are fully crewed in terms of technical staff not every ambulance can be guaranteed to have a paramedic on board and at any one time there can in fact be no ambulances in the north of Skye due to them being en route to Raigmore in Inverness. If an ambulance is available it may well not have a paramedic on board. Furthermore, there was until recently a rapid response vehicle based in Portree but this has also now been withdrawn from the area. In the absence of an A and E, it is this parlous system that the most populous area of SLSWR with all of the associated risks depends to access acute and emergency care. Where else would this kind of emergency health provision be regarded as acceptable for the most populous area in a civilized country?

NHSH report 30 and 60 minute population driving times to the two alternative hub locations³ and these numbers are shown in Figure 1 below as 30 min data and 60 min udata (unadjusted) respectively. Since neither Broadford nor Portree’s drive times overlap at the 30 minute horizon, no relative population adjustment needs to be made and it is clear that the 30 min drive time favours Portree by a margin of over a thousand. But the difference becomes much more dramatic when the actual true population is added in, 30 min plus daily influx. Here the population difference is approximately 3 times, underscoring the points made above that given the much greater population in Portree and the greater risks associated with that population it is crucially important that the maximum number of lives can be saved at this horizon.

Figure 1: Population numbers within 30 and 60 minutes drive time of Broadford and Portree



Notes: The labels ‘30 min data’ and ‘60 min udata’ (udata=unadjusted data) are the drive times to Portree and Broadford hospitals as reported by NHSH; ‘60 min adata’ (adata=adjusted data) are the 60 minute drive times recognizing that Portree has a population 3 times the size of Broadford; the ‘30 min plus daily influx’ and ‘60 min adata plus daily influx’ are the 30 and 60 min figures respectively with the daily population influx as discussed in the paper.

The 60 minute drive times – the Golden Hour - as reported by NHSH are ‘60 min udata’ (unadjusted). However, there is an overlap of both Portree and Broadford distances at the 60 minute horizon since the population of both locations can reach the other in 60 minutes. It follows therefore that the figure for Broadford includes the core population of Portree which as noted is over 3 times larger than Broadford. So Broadford only has a superior 60 minute distance because Portree has the largest

³ See: ‘Population drive times access to community hospitals in Skye and Lochalsh and South West Ross’, I Douglas, November 2013, NHSH, Health Intelligence and Knowledge Team.

population! Adding in the many tourists reinforces the absurdity of reporting such a figure without adjusting for the population difference (e.g. imagine if for some reason the total population of Broadford decided to move to the Portree area and there were no other changes, then on the basis of NHSH calculations Broadford would still be the optimal place to put the hospital in terms of 60 minute drive time despite the fact that no one lived there!).

Since Portree clearly has the much higher risk/ cost profile it is clearly important to adjust the 60 minute figures for the relative disparity in populations between the two locations which is the appropriate comparison given the overlap. These numbers are shown as '60 min adata' (adjusted) and again show that Portree is the key location in terms also of the Golden Hour. Adjusting this 60 minute figure for the higher underlying daily additions to its populations is shown as '60 min adata plus daily influx' which again decisively favours Portree as do the figures for the projected population growth over the planning period (not reported here but available on request).

3.8 Lifeboat access

The main RNLI lifeboat station for the north of Skye, serving an area up to Lochinver, is based in Portree and serves not only as a sea-based emergency service but also as a land-based emergency service for the Isle of Raasay now that NHSH have withdrawn their previous nursing service to that island. It is important to note in regard to both these vital emergency services that due to tidal conditions the RNLI boat cannot dock at Broadford and has to discharge any injured persons or emergencies at Portree. Given that it can take anything up to an hour for the lifeboat to get the injured to Portree, an A and E in Portree is the only realistic option for saving lives here. Clearly the extra 35 minute drive to Broadford would take most, if not all of their passengers, outside the Golden Hour if there is no paramedic in Portree to meet the boat. As noted elsewhere without a 24/7 A and E there is no guarantee of this. Needless to say, there is no RNLI lifeboat base in Broadford.

3.9 Distributional effects including deprivation

'Policies, programmes and projects may give rise to distributional effects between people of different **incomes, ages**, genders, religions, ethnic groups, **health states**, skills or **locations**' (SCIM and the Green Book). Both the Green Book and SCIM note the importance of the distributional effects of a project and indicate they should be: 'identified and as far as possible quantified in appraisals' (SCIM). More generally, the concept of distributional effects flags up the fact that the siting of a new hospital, can 'lead to gainers and losers and how the costs and benefits are distributed among different individuals or sectors of the economy can be very important. In general proposals that deliver greater net benefits to lower income groups should be rated more favourably than those that benefit higher income groups.' (SCIM).

SCIM suggests using the weighted scoring exercise adopted by NHSH to do this but despite the importance of this the NHSH location appraisal has completely ignored such distributional effects. A couple of important examples of distribution effects in the context of the current proposal are now given.

Income. As NHSH's own analysis demonstrates, the north of Skye has the highest rate of income deprivation for the whole area with 75% of those in the category in

North Skye.⁴ The two areas in North Skye with the most deprived areas are Portree North and Portree West, closely followed by Skye North East. The only other area which comes close to these numbers is Kyle of Lochalsh).⁵ As the Green Book makes clear the reason it is important to capture such deprivation effects is that for those on low income the removal of 24/7 A and E facilities will have a disproportionate effect on these individuals. Annex 5 of the Green Book demonstrates in great detail how these effects can be measured and the SCIM recommends evaluating such distribution effects using the very weighted average model that NHH use for their partial and seriously flawed analysis. This has been completely ignored by NHH.

Age. The current proposed redesign of health care in SLSWR involves the removal of hospital beds, with the savings supposedly being reinvested in alternative community care for the elderly. This proposal is however so weak in detail and on practical implementation that it will quickly unravel into a crisis detrimental to those who are trying to remain in their communities, abandoned in their homes until they require hospital admission which will for many be at such a distance from home that relatives will only be able to visit infrequently.

The costs of this failure to deliver will be huge in terms of financial running costs, drafting in locum and bank staff as well as paying huge sums to the private sector. These costs do not enter anywhere into the cost benefit calculus of the redesign but they clearly should if the distributional aspect of the options appraisal are recognised. The increased hardship for patients and carers that the current design will generate will be one of its greatest failures.

3.10 Implications for the local economy and the environment

'Wider social and environmental costs and benefits ...need to be assessed' (SCIM). We noted above the many extra journeys that would be made from the most populous area to the less populous area if the new hospital with A and E is placed in Broadford, and that these should be costed at full economic costs. Who is going to pick up the tab for the consequent implications for the local economy of people having to take far more time off work to attend or visit hospital than would be the case if it were located in the main population centre?

As is well known, the considerable prosperity that has been generated in the Portree area, which has ripple effects through the whole of the Skye and Lochalsh economy and indeed beyond, is based on the vibrant tourism industry. How are the half million tourists per year that stay predominantly in Portree and the north of the island going to feel about the fact that an A and E facility has been withdrawn, and that despite Portree being the kind of urban area that offers them all of the usual benefits of restaurants, accommodation etc along with the attendant risks, they may be completely unable to access an A and E in an emergency? Where else in Scotland or indeed anywhere else in the UK does such an absurd and scandalous situation arise? Of course if such an incident were to occur this would in addition to the tragic personal consequences have devastating effects on the local tourism industry

⁴ See: 'Income deprivation in Skye, Lochalsh and West Ross', I Douglas, July 2014, NHH, Health Intelligence and Knowledge Team.

because the only health provider in the area had in fact ignored the main driver of the area by assuming that the whole area is equally rural.

The many extra unnecessary journeys discussed above over the course of 60 years will have untold consequences on the environment and the road structure, and will lead to a higher probability of road traffic accidents, but again these have not been costed, despite a requirement to do so and clear guidance being given as to how to incorporate such wider environmental effects in selecting a preferred location.

Concluding Comments

This paper has demonstrated that the location options appraisal conducted by NHSH does not follow the mandatory requirements as stipulated in the SCIM and does not lead to an optimum use of resources as the net benefits of the proposed spend have clearly not been maximised. It seems extraordinary that NHSH have got so far with their proposal with no one in authority apparently aware of the litany of omissions and errors in the process. For any project involving public money this is obviously a very serious matter. For one involving the lives of so many locals and tourists the gravity is at least redoubled.

The capricious withdrawal of an A and E service from Portree is based on no objective evidence other than a brutal cost cutting exercise. It is a recommendation of this paper that the A and E service in Portree is immediately reinstated before any lives are unnecessarily lost for the objective reasons clearly articulated in this paper. The second key recommendation of this paper is that if the new hub hospital for SLSWR is located on the basis of objective evidence, using mandatory Government guidelines, it should be built in Portree. This is the only location in the whole of SLSWR that the net benefits of a £15million spend are clearly and unambiguously maximised, which equates to the maximum number of lives being saved over the life of the project.