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# Remote Pre-hospital Emergency Care Education: An analysis of online courses provided by BASICS Scotland



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Dr. David Heaney

Rossal Research & Consultancy

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Dr. David Heaney, September 2016

# EXECUTIVE SUMMARY



Since 2011 BASICS Scotland has delivered tele-education courses to remote and rural health care staff. There are both paediatric and adult emergency medical care courses. Courses are presented live through an internet-based video conference system. Each session is recorded and made available along with supporting materials so that participants can view sessions in their own time. This report was commissioned by BASICS Scotland to analyse activity on their online courses.

Twelve tele-education courses have been delivered, involving 775 participants. Almost three quarters of participants were doctors, and most worked in a remote and rural area.

The 78 participants on the April 2016 course viewed the 10 sessions 1209 times. The asthma session was viewed the most at 239 times (3.1 views per participant). Participants accessed online resources for the course 5702 times (73 views per participant). There was variation in the number of times individuals accessed the resource. 57 percent of views were out of normal office hours.

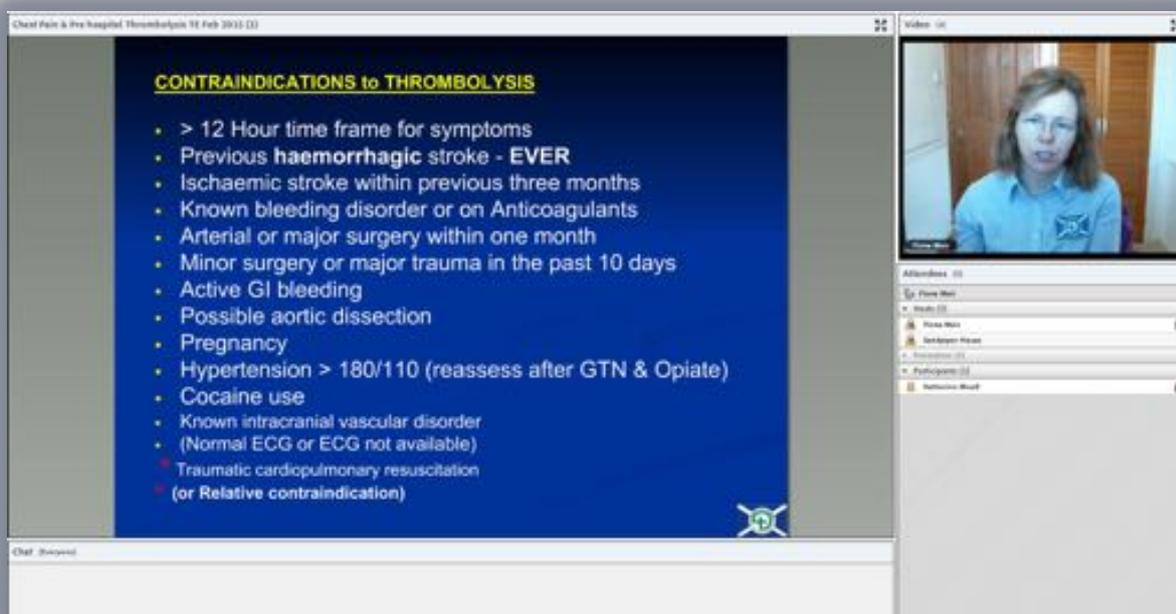
Observation of training sessions ascertained that most participants did not attend the live sessions. The number of live participants varied from 1-4. However, the set up was good, the lectures seemed clear, interaction took place, and there appeared to be real benefits to interaction.

The general consensus from participants was that this was an excellent course well presented, with main topics addressed. The vast majority of participants had no problems connecting to the course. Being able to access the video session at any point was seen as invaluable.

An estimate of total savings by BASICS Scotland delivering their tele-education courses online rather than face-to-face to date is £852,500, equivalent to savings per course of £71,042 and savings per participant per course of £1,100.

The analysis demonstrates that BASICS Scotland are providing tele-education, at scale, to remote and rural primary care staff, in a way that is saving considerable resource, and which is raising interesting issues about the future of delivery of education to the health workforce.

# INTRODUCTION



BASICS Scotland (British Association of Immediate Care - Scotland) has been in operation as an independent charity, in Scotland, since 2002, specialising in promoting the provision of high quality pre-hospital emergency care to health professionals in Scotland. This includes providing traditional face-to-face training and on-line training in partnership with NES (NHS Education Scotland).

Since 2011 BASICS Scotland has delivered a **Tele-education course** to remote and rural health care staff. This enables training to occur without the need for time off, backfill, and travel. The courses are delivered from a studio using professional broadcasting equipment at BASICS Scotland head office in Auchterarder.

There are both paediatric and adult emergency medical care courses aimed primarily at doctors, nurses and paramedics delivering care in the pre-hospital environment. New evidence based topics are delivered by weekly 1 hour sessions over 9-10 weeks. It costs £150 for non-members and £135 for BASICS Scotland members to participate. Topics delivered in the paediatric course include Child with Fever; Meningitis; Asthma; Epiglottitis & Croup; Seizures; Head Injury; Allergy and Anaphylaxis; Gastroenteritis and Dehydration; Pain Relief; LRTI and Pneumonia. The adult course covers: Allergy & Anaphylaxis; Asthma; LVF – Adult Pneumonia; Stroke & TIA; Chest Pain & Thrombolysis; Head Injury; ENT Emergencies; Wounds, Burns & Tetanus; Pain Relief; Seizures.

Courses are presented live through an internet-based video conference system using Adobe Connect which can be accessed with an internet connection and up-to-date web browser with the latest Flash Player plugin installed. Each live session is recorded and made available on an e-learning website along with supporting materials so that participants can view sessions in their own time. Successful completion of the course will result in candidates being issued with a certificate of attendance including the number of contact learning hours for CPD.

Another innovative telemedicine course offered since 2013 is the **Remote Skills Training Course**. This training is similar to that delivered on life support courses such as BASICS Courses or ILS. It involves demonstration of practical procedures followed by course participants practising on manikins sent out by the course organisers in advance of the training. The class sizes are smaller because of the nature of the training, which is intensive, “hands-on” and interactive. Class sizes have been reduced over time as instructors felt larger class sizes decreased the educational value. There have been 49 participants over the 13 courses, almost all participants have been doctors.



Training pods containing all equipment necessary to take part in remote skills training course are sent to each participant



HD webcam is supplied to facilitate 2 way communication



Remote skills training session with the instructor demonstrating the technique and the participants practicing under direction

Using methods developed in the Remote Skills Training Course BASICS Scotland also provide a **Remote Cricothyroidotomy Course** for those who have previously had training on a face-to-face course. BASICS Scotland have developed a surgical airways training model that enables remote practitioners to practice skills in **Emergency Surgical Cricothyroidotomy**.

The Sandpiper Trust is a charitable organisation formed to provide remote and rural medical practitioners with equipment that would allow them to provide immediate care at the scene. Their partnership with BASICS Scotland has resulted in almost 1000 Sandpiper Bags being issued to BASICS Scotland Responders. BASICS Scotland is also using technology in an innovative manner to check, and update the contents of Sandpiper bags. This is undertaken online; rural health staff at the “remote” end open the Sandpiper bag. BASICS Scotland staff examine the contents over the videolink, making sure equipment is present, in working order, is the most up to date version, and is in date. Any replacements required can be sent to the practice.

This report was commissioned by BASICS Scotland to document the level of activity, feedback from participants and interaction in the online courses. This report also examines the cost savings and other benefits to rural practitioners.

Several sources of data were used to ascertain the level and type of work that BASICS Scotland undertake. These include:

- Analysis of activity data, available from software systems as a by-product of administration of the courses
- Analysis of feedback from participants
- Observation of training sessions

The analysis focuses on the **Tele-education course** because this course is being delivered at scale, and there is more data available.

# RESULTS



## 1. Activity

During the time period September 2011 to April 2016 there were twelve tele-education training courses (2-3 per year) provided by BASICS Scotland. Six courses were adult and six were paediatric. The adult course had ten sessions, the paediatric course had nine. In total, this amounted to 114 sessions provided. There have been 775 course participants, some of whom undertook more than one course during this period. If all participants viewed all sessions, that equates to approximately 7440 individual training sessions. Almost three quarters of participants were doctors, 21 percent were nurses, 6 percent paramedics and 1 percent were ambulance technicians. The size of the classes varied from 24 to 99, but there was no apparent trend over time in numbers participating. Most participants worked in remote and rural areas.

The activity in the most recent course (April 2016 adult course) was examined in detail. There are two datasets produced as a by-product of delivering the courses that can be interrogated.

Firstly there is a log of each viewing of the recorded sessions on Adobe Connect. At time of writing, it was not possible to identify who had accessed the videos, or at what time they were accessed, just the number of times each session had been viewed. Secondly an activity log of resources accessed by participants is generated by the software used. This does capture dates/ times and identities (which were anonymous for analysis purposes, but coded by gender). Together these databases permit an analysis of the behaviour of course participants.

## 1.1 Number of views of the recorded sessions

Course materials are available to participants for 20 weeks after the course begins. During that time, the 78 course participants viewed the recorded sessions 1209 times in total. This was an average of over 15 views per participant. It is unknown whether participants viewed the whole session; it is probable that in some cases viewing was interrupted. The first session (asthma) was viewed the most at 239 times, which equates to 3.1 views per participant. The number of views per participant declined for the later weeks in the course, as shown in *Table 1*.

**Table 1 - Number of views per session**

Session	Number of views	Mean views per participant
Week 1 – Asthma	239	3.1
Week 2 – LVF	158	2.0
Week 3 – Chest Pain & Thrombolysis	150	1.9
Week 4 – Stroke & TIA	103	1.3
Week 5 – Allergy and Anaphylaxis	111	1.4
Week 6 – Wounds, Burns and Tetanus	103	1.3
Week 7 – Head Injury	94	1.2
Week 8 – Seizures	74	0.9
Week 9 – ENT Emergencies	95	1.2
Week 10 – Pain Relief	82	1.1
Total	1209	15.5

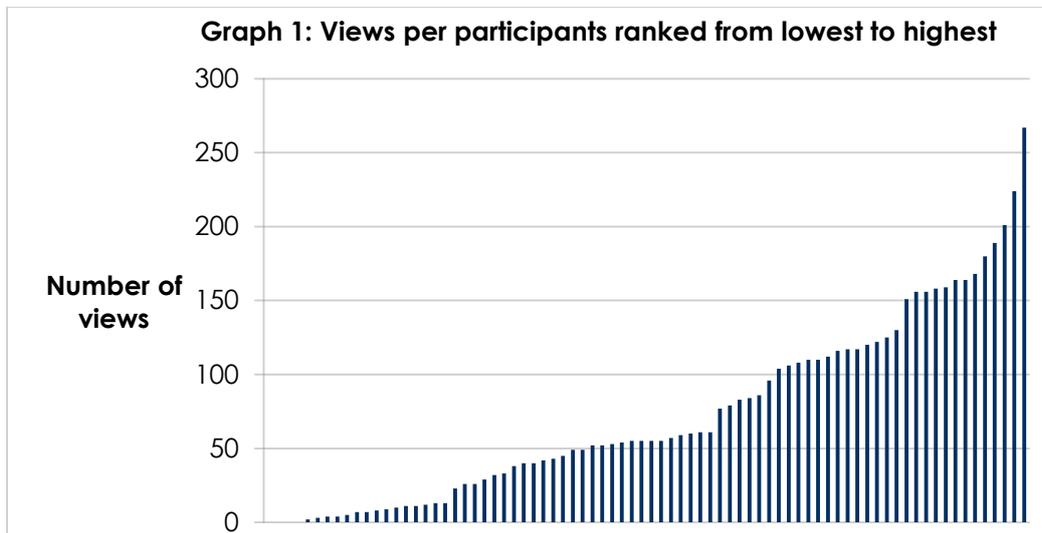
The lowest number of views was for week 8 - seizures at 0.9 views per participant meaning at least 4, did not watch the session, and probably more if some watched more than once, as is likely. There may have been an order in relevance of the lectures to the participants, with earlier sessions being seen as more important, and also people will likely have worked through the course in order, and had less time to view the later sessions.

If these figures are extrapolated to the other training sessions, then there have been over 14,000 views of training sessions by participants on the **telemedicine course**.

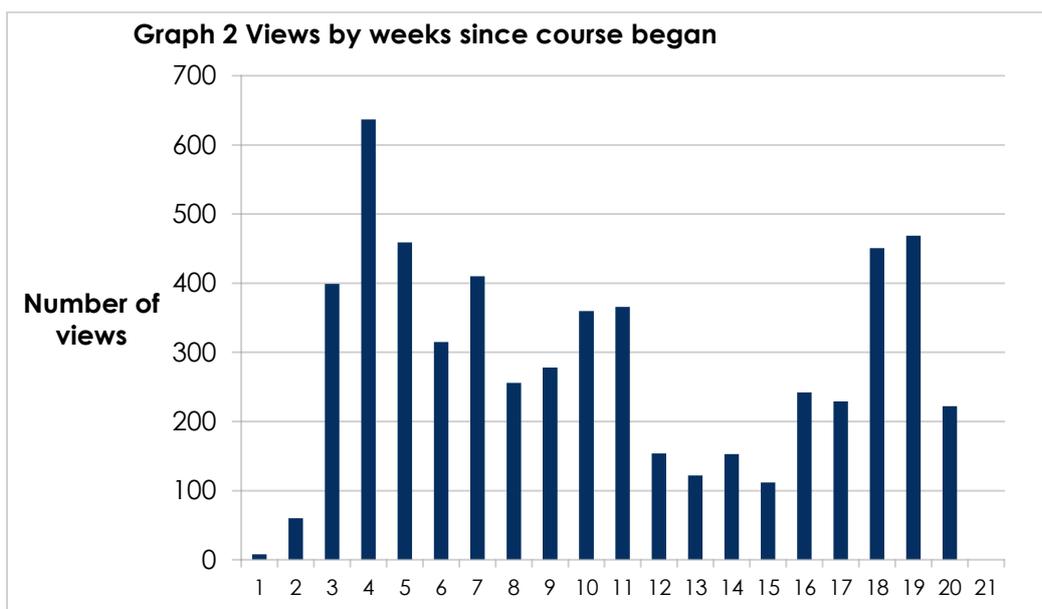
As this analysis was underway, it was possible for BASICS to undertake some prospective analysis to ascertain whether participants “crammed” the course, as they were able to note the date of course completion. Of the 78 course participants on the April 2016 tele-education course, 30 were still to complete with one week until the course closed. After a reminder, 20 participants still had not completed the course when the deadline for closure was reached. It is possible to pay £50 for a course extension, and 16 requested an extension (2 of the 16 had completed the course but wanted access to the materials for another 6 months, 1 of the 16 was not interested in certification, just wanted continued access to the materials). Two course participants were given a free extension of a week to complete, and 4 were not in contact.

## 1.2 Number of views of the online resources

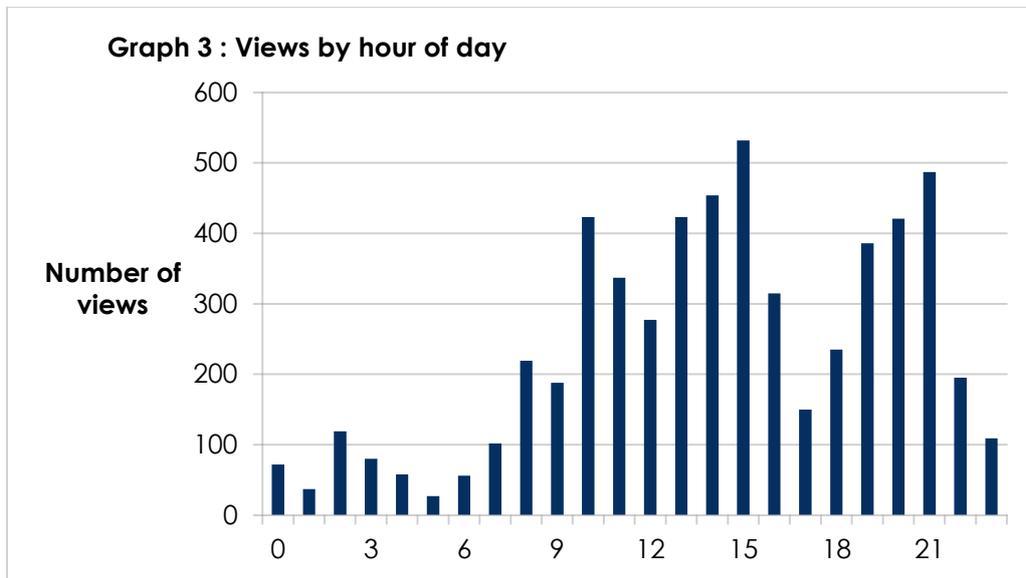
With the second data set it was possible to undertake some more interesting analyses. This dataset records all views of the resources and links available for the course. Participants accessed these resources 5702 times in the 20 weeks they were available. That equates to a mean of 73 times per course participant. There was large variation in the number of times individuals accessed resources. Four did not access these online resources at all, whilst the highest number of views was 267. The distribution of views per participants is shown in *Graph 1*. Eight out the 10 highest “viewers” were female.



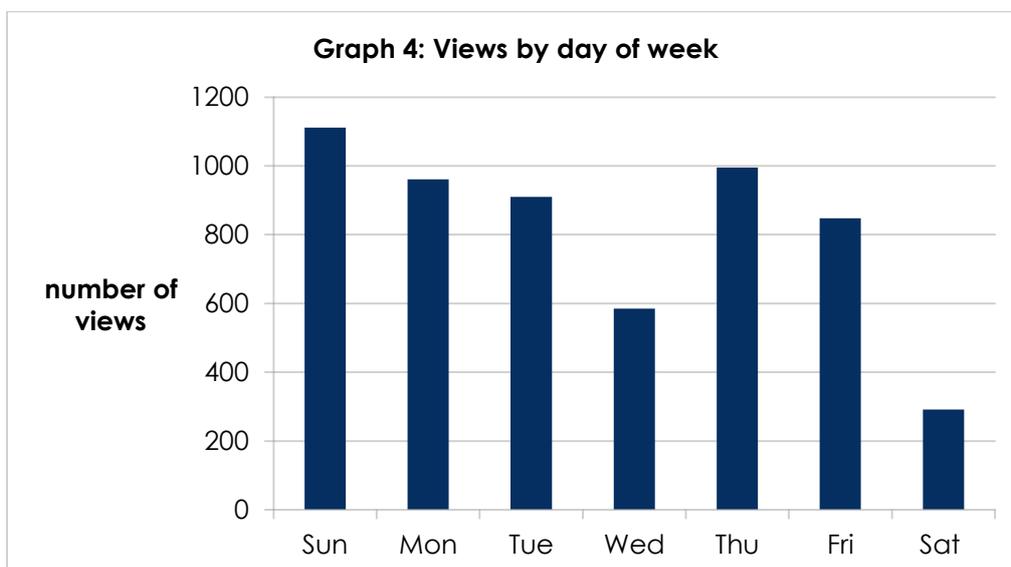
Views of resources were highest several weeks into the course, and then steadily declined as the weeks progressed. There was a late flurry of activity as participants attempted to complete the course, as shown in *Graph 2*.



Participants viewed resources at all hours of the day and night. The most common times for viewing were 3pm and 9pm, as shown in *Graph 3*



The number of resource views by day of week is shown in *Graph 4*. This shows that participants were most likely to view resources on Sunday, followed by Thursday, whereas they were much less likely to be viewing on Saturday. It was possible to work out the percentage of views outside normal office hours. This was defined from Monday to Friday 9am - 6:59pm. In total, 57 percent of views were outside this definition of office hours.



## 2. Views of participants

Two samples of views from participants of the telemedicine course were taken, from the December 2014 paediatric session and the April 2015 adult session. The feedback was read and analysed using a framework approach, and three main themes identified. These were 1: the content and delivery of the course, 2: issues with the course, and 3: the use of new technology

### 2.1 General content and delivery of the course

The general consensus from participants was that this was an excellent course well presented, with main topics addressed, and was worth the money.

*“Very good course and very good presenter”*

It was felt the course was precise, relevant, and provided access to brief concise up to date evidential guidelines. One repeating participant noted that it was good that the course had been updated even from two years ago. The clinical scenarios were seen as a good way to learn.

Several participants commented that the course was very relevant and practical to the practising GP in the out of hours setting, and had refreshed old knowledge. The course was seen as not too academic- but with a practical focus on the practising clinician working alone. While there were some comments that the course was applicable to less 'remote' GPs as well as rural ones, one participant commented it would be useful to have a standardised set of recommendations that deal with less remote practice.

*“answered a lot of the queries I have when alone in middle of night- provides more confidence on what to seek help”*

The written reference material was seen as useful. One course participant mentioned the discipline of weekly pre-lecture reading making the lectures more useful. Some respondents said they would consider doing similar courses in the future. Several respondents had instituted some changes related to learning.

## 2.2 Issues

The main issue with the course was the post course MCQ questions, which some felt to be ambiguous, and would have liked the correct answers given. Others did feel the quizzes during each teaching session were useful. In fact, one respondent suggested a post lecture test each week to “*sharpen up*”. Other comments included that the course was slightly prolonged and repetitive at times, was time intensive. One participant mentioned, who had done the course before, that a little more detail and depth may have been useful.

## 2.3 Use of new technology

The vast majority of participants had no problems connecting to the course, either the live or recorded sessions. The support was described as excellent, in terms of organisation, timekeeping, interaction, website accessibility, support when problems with accessing, and email feedback.

*“couldn't log on at one point, however the administrator reset my passwords and it was corrected in no time at all. Very quick to respond to my problem. Excellently handled thanks.”*

One participant mentioned it was challenging to undertake due to unreliable Internet connectivity at their end, and on one occasion a firewall excluded access to the session. Another participant reported difficulty accessing adobe technology on an iPad.

Some participants reported that the use of video clips to show clinical signs was helpful. One respondent wondered if more short videos of “*real life*” situations would be useful. The on-line resources were seen as a useful element of the course, and it was seen as important to be able to refer back to these. The discussion boards were also seen as useful.

Being able to access the video session at any point was invaluable; this was noted by many.

*“The recordings were of a nice manageable length and wonderful that I could access them when it suited me”*

It was seen as a useful step using these online modules in keeping up to date in an area that is dealt with infrequently. Trying to get time to attend courses was perceived to be problematic. One respondent admitted to doing most of the course over a weekend – “*a very effective crash course, I hope*”. One respondent would have liked to be able to access the videos again out with the deadline without charge.

One participant felt it would be more useful to watch the session with more of the participants, so that way more questions would be asked. Another participant noted their regret at not being able to join live

*“I would have preferred to be able to participate, but daytime in Primary Care is now such an awful experience in terms of time that this is impossible”*

### 3. Access to Recorded Sessions

DH observed a sample of training sessions from the 2016 adult course. Most participants did not attend the live sessions but listened back to the recorded sessions. The number of live participants varied from 1 to 4. As a non-clinician researcher the following observations were made

- the set up was good: clear in sound and vision, and well supported by BASICS staff.
- the lectures themselves seemed clear, concise and presented in a rigorous manner, with informal quizzes and questions thrown in to keep participants engaged.
- interaction between the few live participants took place, and this was done in a supportive, light hearted and sharing style.
- it is difficult to ascertain why there are not more live participants, as there appear to be real benefits to the interaction. It is possible some participants prefer to be passive observers, and shy away from the live sessions. Alternatively it may be the training session is hard to fit into a normal general practice day.

## 4. Health economics

A rough calculation as to how much more it would cost to deliver the same amount of training face-to-face for 775 participants on 20 hour courses. This is equivalent to 15500 person hours of training that BASICS has provided. Assumptions made are as follows:

- Assume online course is undertaken without backfill
- Assume providing the training costs the same to provide in terms of lecturers and materials whether face to face or online
- Assume equivalent level of training face-to-face is provided
- Assume participants undertake the same amount of training delivered over 3 days instead of 20 \* 2 hour sessions
- Assume on average 1 days travel time per participant to get to and from course
- Assume locum rate of £400 per day
- Backfill per participant : low estimate 1 day, medium estimate 2 days, high estimate 3 days
- Assume accommodation rate @£100per night
- Accommodation per participant : low estimate average 1.5 nights , medium estimate average 2 nights, high estimate average 2.5 nights

Calculations are shown in *Table 2*. These can be adjusted for different scenarios, or if better cost data is available. Backfill, travel and accommodation nights will vary depending on how far the participant is from the course location, and whether an element of the course is delivered at the weekend. The estimated total cost savings of BASICS delivering their tele-education courses online rather than face-to-face to date lie between £484,000 and £1,221,000. The mid estimate of total savings is £852,500, equivalent to savings per course of £71,042 and savings per participant per course of £1,100.

**Table 2 - Cost savings of online training**

Assumptions	Low	Medium	High
Backfill per participant 775@£400 (low estimate 1 day, medium estimate 2 days, high estimate 3 days)	£310,000	£620,000	£930,000
accommodation per participant 775@£100 (low estimate average 1.5 nights , medium estimate average 2 nights, high estimate average 2.5 nights)	£116,250	£155,000	£193,750
average travel costs (low estimate £75 , medium estimate £100, high estimate £125)	£58,125	£77,500	£96,895
Total cost saving estimate	£484,375	£852,500	£1,220,645
Cost saving per course	£40,365	£71,042	£101,720
Cost saving per participant	£625	£1,100	£1,575

# DISCUSSION



This report describes a significant development in tele-education in Scotland, which has particular relevance to remote and rural healthcare. Relatively large numbers of staff (775) have accessed the course since 2011, although there are some individuals who have taken the course more than once. Financial savings have been identified, and undoubtedly this course has increased access to education to rural GPs, nurses, and paramedics. All this is worthy of note.

When telemedicine is successful it becomes embedded, and part of medicine. Similarly, tele-education becomes just another form of education delivery, and potentially a more relevant form. This course has become embedded as part of everyday practice. There are certain specific skills and techniques that work better in remote delivery of services, these are only beginning to be understood. Lessons can be drawn from the remote provision of this course that may apply to education in other areas of practice.

***How has scale been reached, and maintained?*** There are several key components. Firstly, course content and relevance needs to be right. Participant feedback demonstrates this is the case. BASICS Scotland has extensive experience in the delivery of traditional face-to-face education courses and

this contributed to ensuring content and delivery are appropriate. Second, the technical support needs to be right. The use of accessible software, good on-site studio facilities and technical support are vital, and it is clear participants feel this has been achieved. There have been no substantial issues with the courses. Again, experience and development work has been applied to overcome obstacles to the use of tele-conferencing to deliver teaching remotely. Third, the conditions for use of tele-education need to be right. In this case, attending the on-line course is saving time, effort and resources for participants, so it is a sensible and practical decision to learn in this way. Other factors may have also had an impact in enabling this course to become embedded. The remote skills training course, and refreshing of Sandpiper bags, and the development of tools to deliver a remote cricothyroidotomy course demonstrate evidence of an innovative environment. The organisational setting of BASICS Scotland, slightly outside the NHS but linked to it, may have helped flexible solutions to emerge. The fact that participants must pay to undertake the course indicates that individuals appreciate the benefits of this facility. The fact there is a deadline when access to course materials ceases may encourage some to complete the course, having paid for it.

***Behaviours of online course participants.*** Firstly, why are participants using the recorded sessions more than the live sessions? The most likely reason is that there are too many pressures in a modern working day to allow time for training to be fitted in. This type of course may be more suited to modern general practice than traditional face-to-face training. This does not only apply to rural practice, but may be worth considering in other settings. Perhaps course participants are watching these sessions when on call in the evening or weekend, or at home, on a laptop, in peace and quiet. Perhaps some are behaving like many who “binge” on television series, watching the entire series of “Game of Thrones” over a few days rather than one a week. It would be instructive to find out more about this, to adapt delivery of education to the needs of the workforce. It is possible that evening/weekend live sessions would be more popular for those joining live. Alternatively, it may be that course participants are accessing the sessions when it suits them best, and it is unnecessary to provide live sessions.

Secondly, it is important to note that course participants are coming back to view the sessions more than once. As yet, it is unknown whether participants didn’t get through all the session at once, or whether they have gone back to remind themselves of content, but this can be investigated in the future, and in either case, a different type of learning is going on. This is even more so the case with the online resources provided, which were viewed an impressive 5702 views in the last course. The potential benefits of this type of learning are as yet unknown, but it is important that work continues to explore the issues raised.

In conclusion, this analysis demonstrates that BASICS Scotland are providing tele-education, at scale, to remote and rural primary care staff, in a way that is saving considerable resource, and which is raising interesting issues about the future of delivery of education to the health workforce.

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Dr. David Heaney

Rossal Research & Consultancy