Engaging medical students and their teachers with the determinants of health: the approaches and impact of a curriculum development at one large UK medical school

Ann Wylie, Kathleen Leedham-Green and Yuko Tadeka

Abstract

**Background:** Social determinants of health (‘SDH’) often underlie the health behaviours that contribute to non-communicable disease. Doctors need to be aware of health behaviours and their determinants and the evidence-based interventions to address them.

**Aim:** Co-ordinated core curriculum modifications were instigated with explicit learning outcomes in and around health promotion and SDH. This paper reports on the research evaluation of process and outcome and sustainability of these changes in one large medical school.

**Method:** Mixed method research data were used to inform an action research cycle. Data were analysed for content and emerging themes related to smoking cessation, obesity reduction, and global health were informed by SDH.

**Results and analysis:** Students demonstrated knowledge and concern relating to SDH, although some initially lacked confidence in applying this knowledge. Students reported inconsistent modelling clinical environments. Attention was given to the learning environment as well as teacher training to facilitate and support self-efficacy through reflection and critical analysis.

**Conclusion:** Newer medical education themes such as SDH need robust preparation for inclusion in core curricula, with attention to the social, cognitive and environmental impacts on learning. Teaching and experiential learning for SDH is now embedded in this curriculum.

**Practice points**
- Integrating teaching and assessment around SDH for core medical curricula is challenging, with regard to specific content, process, faculty and teacher development, defining learning outcomes and appropriate assessment.
- SDH when well integrated provide students, and their teachers, with opportunities to identify and possibly address some SDHs both in clinical encounters and in population interventions.
- All qualifying medical graduates should have skills to address significant determinants of health such as smoking and obesity. There is an evidence base to guide these approaches.

**Keywords:** Curriculum, social determinants of health, health promotion, and undergraduate.
**Article**

**Introduction**

The role of the medical professional, in terms of awareness and response to health behaviour and the underlying social determinants of health, has become an increasingly integral aspect of debate and practice for a variety of complex reasons. Healthcare systems, policy and politics are being driven by the need to achieve a sustainable health economy which is being eroded by the rise in ‘preventable’ non-communicable disease and escalating treatment costs. Better health informatics have helped to quantify the impact of SDH on patients’ health, including socially-driven health behaviours, health literacy, and environmental and economic challenges (Marmot, 2010, Marmot et al., 2008, Wilkinson). There has also been a rise in the evidence base for the effectiveness of interventions, as well as their challenges, on an individual, community and global health (Marmot et al., 2012).

Introducing newer themes into medical undergraduate curricula (Jones et al., 2001, Litva and Peters, 2008), presents challenges but lessons can be learnt from previous newer topics such as health promotion (Harden et al., 1997, Weare, 1998). (Wylie et al., 2009, Wylie and Holt, 2010, Wylie and Thompson, 2007) This brings into focus the need to be clear about content and learning outcomes for both learners and teachers, the need to be attentive to context for learning and to harness best practice for appropriate pedagogical approaches including opportunities for students to put their learning into practice. There is a need to train the teachers, as well as students, who may have had limited exposure to the subject content and approaches to teaching. There is a risk that learning outcomes, and in particular assessment, may remain vague, ideological and conceptual, and without senior role modelling it may be difficult for graduating doctors to see the relevance to their future practice (Litva and Peters, 2008).

Whilst Marmot has continually argued that SDH can be improved (Marmot, 2010) and the General Medical Council (General Medical, 2009) support the potential role of doctors in reducing health inequalities, little has been published on how this should translate into medical curricula to prepare graduates.

This paper describes and discusses the approaches used at one large UK medical school to integrate SDH into the core curriculum for the final three years, predominately linked to GP placements.

Social determinants of health – working definitions

The World Health Organisation [WHO 2011] provides the following definition:

*The social determinants of health are the conditions in which people are born, grow, live, work and age, including the health system. These circumstances are shaped by the distribution of money, power and resources at global, national and local levels. The social determinants of health are mostly responsible for health inequities - the unfair and avoidable differences in health status seen within and between countries.*

The related disciplines of health promotion, public health, global health, and the psychology and sociology of health, have now become established in medical curricula, with regulatory bodies such as the General Medical Council (GMC) in the UK requiring their inclusion for graduating doctors (General Medical, 2009).

At this medical school the working definition for teaching and learning around SDH extends these disciplines to include patient centeredness, partnership-approaches to behavioural change, applied clinical communication with an awareness of context and as a synthesis of facts, working with patients to identify what factors are impacting on their ability to manage their own health, and ‘treating’ the patient by addressing these issues.
Curriculum development
Few medical schools can radically modify their programmes as they introduce new curricular elements with many having to review and revise in modest rather than dramatic ways. This paper describes how these elements were introduced, developed and implemented introduced at one large UK medical school in the final three years of the course.

At least 10% course time in UK medical schools involves self-selected components (‘SSCs’) where students engage in self-directed project work under the supervision of faculty teachers. A number of SSCs relating to SDH were offered, enabling interested students and tutors to develop an appreciation of these topics with regard to health outcomes. Student feedback argued for more of this topic area to be included in the core curriculum, with some students taking active roles in supporting curriculum initiatives and their implementation (Jones et al., 2013).

Curricular content revisions were informed by a range of evidence-based guidance and pathways developed by NICE (National Institute for and Clinical) and global health learning outcomes were informed by consensus-based guidance from Johnson et al (Johnson et al., 2012).

It was both timely and pragmatic to look at opportunities to integrate SDH elements into existing programmes. In this way, relevance to wider concurrent learning was promoted, extra workload on students and faculty was minimised, and by integrating SDH into existing learning experiences, students were encouraged to develop a fuller understand of the applicability of key concepts as they relate to clinical practice, professionalism and advocacy.

In summary, the final three years of this medical undergraduate course since 2011 have seen additional core components, with associated assessments, integrated into students’ wider learning, with the aim of providing the knowledge and skills needed to address SDH. Attitude development about the relevance of such learning for tomorrow’s doctors was explicit in all years. These changes justified in-depth action research to assess the impact of the process and outcome, the feasibility and sustainability of these changes, and any ongoing improvements and adaptations.

Method – curriculum implementation
The final three years at this medical school are known as phase 3, phase 4 and phase 5. The new and adapted elements relating to the social determinants of health and health promotion were as follows:

Phase 3, 4 and 5
All students were advised to do the National Centre for Smoking Cessation Training (NCSCT) online Stage 1 smoking cessation training, successful candidates gaining a nationally recognised qualification by arrangement with NCSCT.

Ongoing encouragement was needed for this as it was not compulsory, with approximately a third of students graduating with Stage 1 and some successfully progressing to Stage 2. No cost was involved.

Phase 3
An existing global health lecture was enhanced to include teaching on SDH and global prevalence of tobacco use, alcohol consumption and obesity and this was related to the common conditions students currently encounter during clinical placements, with assessment via Single Best Answers (SBAs).

A small group session on behavioural change/brief intervention/motivational interviewing was enhanced to include consideration for SDH, informed by the NICE guidelines on behavioural change which explicitly recognise social contexts. This teaching was delivered as part of the therapeutics strand to encourage students to see supporting behaviour change as a standard ‘therapy’ for non-communicable disease. Assessment was via OSCE.
Clinical teaching sessions in primary care were given a new focus to include a demonstrably patient-centred approach, with consideration for psychological and social contexts and a partnership approach to management. Assessment was by case presentation to GP tutor and OSCE.

Apart from minimal organisational issues, some preliminary piloting and some tutor briefing, these changes to Phase 3 were readily implemented.

Phase 4

An existing community-based longitudinal study, following a pregnant woman from 3rd trimester to 12 week old infant with repeat home visits and GP tutorials, was enhanced by modifying two existing seminars, one at the start and one at the end of the year, to include addressing lifestyle issues such as smoking cessation and obesity in pregnancy, with students deciding to focus on a specific aspect of SDH for their end-of-year assessed presentations. Assessment was by presentation in seminar groups and OSCE.

As part of their GP placement students do a health promotion review, looking at a local community-based intervention, mutually agreed with their practice. Guidance and suggestions are provided by faculty, aiming to benefit and inform the practice about evaluating the efficacy of local interventions. Assessment was by presentation to their GP tutor.

A global health symposium with a choice of workshops was linked to elective preparations with students submitting a compulsory short essay on a global health topic of their choice as part of their pre-elective portfolio. Modifications were introduced to the assessment of elective portfolios so that the global health essays were marked by faculty with an interest in public and global health which involved minimal organisational changes. Student essays were summatively assessed and students received written feedback.

Preliminary piloting and discussions indicated support for these changes and funding was secured for the additional GP input and for global health symposia.

Phase 5 (final year)

A social prescribing lecture was included prior to the students’ eight-week GP rotation. During their GP rotation students were required to spend one day per week learning about community and social support for patients with long-term conditions through a series of community case studies, visiting patients in their own homes and visiting/shadowing the various community resources that these patients used, learning how to identify and address patient problems. Students in their final year are consulting on their own with GP tutor support.

The students were required to submit a 500-word reflective case study for four community cases. They also received teaching on broaching and addressing obesity in a consultation building on their previous behavioural change learning, including role play opportunities. Students were required to submit a 500 word reflective case study on a consultation with an obese patient. No additional costs were incurred as faculty revised existing sessions and made explicit links to teaching in Phases 3 and 4. Following feedback and analysis of the case studies, the number of community cases required for submission was reduced from four to three, allowing for deeper rather than broader learning. From the obesity case studies, inconsistent role modelling was identified as a barrier to effective practice and funding was secured for a GP tutor training day, attended by 60 GP tutors, with an ongoing e-learning module to ensure a consistent approach to teaching on this relatively new health topic.

Discrete elements were identified for the research and these are summarise in table 1.
<table>
<thead>
<tr>
<th>Topic</th>
<th>Summary of curricular change</th>
<th>Faculty preparation</th>
<th>Research data</th>
<th>Assessment</th>
<th>Comments</th>
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<tbody>
<tr>
<td><strong>Global health</strong></td>
<td>Phase 3 global burden of disease symposium lecture; phase 4 symposium with choice of workshops</td>
<td>Funding for speakers and facilitators from NGOs; faculty for marking essays</td>
<td>Student focus groups; global health essays; course feedback</td>
<td>Summatively assessed global health essay; SBAs</td>
<td>Linked to elective to improve relevance; many insightful essays</td>
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<tr>
<td><strong>Partnership approaches to patient problems</strong></td>
<td>Phase 3 workshops on behaviour change; phase 3 GP focus on patient-centred approaches</td>
<td>Recruiting and briefing facilitators and provision of materials; briefing GP tutors</td>
<td>Student focus groups; GP tutor focus group; course feedback</td>
<td>OSCE; patient-centred case presentations</td>
<td>Trialled in both primary and secondary care; students reported better learning experiences in primary care</td>
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<tr>
<td><strong>Supporting smoking cessation</strong></td>
<td>NCSCT accreditation; SSC opportunities; phase 4 health promotion intervention reviews; students as resources for smoking cessation support in primary and secondary care</td>
<td>Arrangements with NCSCT for students to receive accreditation; encouragement and enablement of student-led activities; liaising with hospitals/practices</td>
<td>Student focus groups; health promotion reviews; NCSCT data; course feedback; SSC and student-led project work</td>
<td>NCSCT exam; OSCE; SSCs summatively assessed; SBAs</td>
<td>Students engaged although not yet compulsory; students value practical experience so skills do not atrophy</td>
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<tr>
<td><strong>Addressing obesity in a consultation</strong></td>
<td>Phase 3 behaviour change workshops; phase 5 lecture and role play; compulsory reflective case study</td>
<td>Briefing for GP tutors; training day and e-learning for GP tutors</td>
<td>Reflective case studies; course feedback</td>
<td>OSCE; formative feedback from GP tutors; reflective case studies</td>
<td>Case studies facilitated experiential learning and needs assessment; GP role modelling key</td>
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<td><strong>Promoting exercise, reducing inactivity</strong></td>
<td>Year 2 exercise for health lecture; phase 4 health promotion reviews; phase 5 exercise prescribing lecture</td>
<td>Exercise prescribing workshop at GP training day; exercise prescribing pads distributed; e-learning</td>
<td>Reflective case studies; course feedback</td>
<td>Health promotion review presentations; reflective case studies; SBAs</td>
<td>Limited data on how exercise prescribing pads are being used</td>
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<tr>
<td><strong>Social prescribing</strong></td>
<td>Phase 4 health promotion intervention reviews; phase 5 social prescribing lecture and community cases</td>
<td>GP tutor training day and e-learning; information on local social prescribing resources compiled and distributed to GP tutors</td>
<td>500 words reflective community case studies; health promotion review presentations</td>
<td>500 words reflective community case studies; health promotion review presentations</td>
<td>GP's reported positive impact on uptake of local community resources due to increased social prescribing</td>
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**Table 1** Summary of curricular changes, grouped by research theme with comments

NCSCT: National Centre for Smoking Cessation Training; OSCE: Objective Structured Clinical Examination; SSC: Self-Selected Component; SBA: Single Best Answer written exam; NGO: non-governmental organisation; GP: general practitioner
Method – approach to research
Ethical approval was obtained with opt-out consent for students and opt-in consent from GP tutors. Only 5 students opted out and all GP tutors that took part consented, contributing to focus groups completing questionnaire surveys if they had attended the obesity training day. All data were anonymised prior to analysis. A mixed method action research strategy was used (Robson, 2011).

Data included:

- Free text from student evaluation data and surveys (all students that submitted feedback)
- Longitudinal focus group data from a small cohort of volunteer students as they progressed from Phase 3 to 5 (convenience sampling)
- Focus group data from students with Stage 1 NCSCT (purposeful sampling)
- Written work from global health essays, community case studies and reflective obesity case studies (systematic random sampling, saturation of themes achieved)
- Focus group data from GP tutors involved in teaching (convenience sampling)
- Data from the NCSCT to establish the numbers of students awarded Stage 1 and Stage 2 smoking cessation certification in March 2014
- Data from the Phase 4 health promotion review presentations quantified for topics
- Data from the reflective case studies quantified to assess changes in student consultations and attitudes to broaching obesity as teaching was modified from 2011 to 2014
- Global health essay content was quantified to look at countries, topics and associations with SDHs from 2011 to 2014
- GP tutors attending the specific obesity related study day (n=60) were given pre- and post-teaching questionnaires, with additional follow up questionnaires at 7 months and 12 months

Focus group data was collected by researchers not directly involved in the teaching. Reflective case study data were coded for content by two researchers independently and then compared for accuracy of content analysis and emerging themes. NVivo was used to assist data analysis.

Results
The results are presented in three broad domains, based on a synthesis of findings across research modalities:

Smoking cessation
The first focus groups in 2012 (table 2) had shown that students were enthusiastic to do on-line courses where they gained nationally recognised qualifications, and saw relevance to learning about smoking cessation for their personal lives as well as their professional lives, but felt ‘atrophy’ was inevitable without the opportunity to apply and use their newly acquired skills. They also noted that ward-based patients were not receiving optimal smoking cessation support and that their clinical teachers were not applying the same approaches that the students had been taught.

In the subsequent academic years, as part of the action research cycle, these needs were addressed, by encouraging GP tutors to harness students’ knowledge and skills in practical projects where possible, as well as students becoming involved in supporting secondary care smoking cessation projects. Some students actively engaged with hospital teams, under faculty supervision, to address the gaps that they observed.

Although the NCSCT course was not compulsory, more than a third (n=116 of 420) of the 2014 graduating medical students have successfully been awarded Stage 1 certificate and 46 students have independently gone on to complete Stage 2.

In Phase 4, for their health promotion review project, 11% (n=45 of 420) of the cohort focused on a community smoking cessation project. This was encouraged proactively by faculty. Student feedback (table 3) indicated that students valued learning about smoking cessation, increased their knowledge of primary care and community services, and actively worked to critically appraise and support change.
30 students have been involved in a smoking status audit of patients admitted to acute wards during three weeks in August in 2013 and 2014. They volunteered for this and three then did further data analysis work for an SSC. This project enabled students to hone and apply their skills of broaching and history taking with regard to modifiable determinants of health and risk factors for disease. A great awareness of the patient’s social context and factors that need to be integral to action plans was evident, with students attempting to move beyond a formulaic intervention and being patient centred.

“This experience has also imparted several skill sets … asking and ascertaining smoking status, assessing patient’s readiness to change, appropriately advising thereon, assisting in creating an action plan and arranging for services to be delivered.”

Table 2: data from NCSCT smoking cessation focus groups 2012

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<th>Theme 1: role legitimacy</th>
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| Students were motivated to learn | “...so if I then said, do you want to quit smoking and they said yes, I didn't really know ... what I would do with that information and that was... concerning me”  
| Phase 3 student |  
| “It needs to be seen as a priority... because we are the future generation of doctors.”  
| Phase 3 student |  
| “I think smoking cessation... should be similar to learning infection control... it should be similar to doing basic policies... It should be something that is examinable from year 3... and then everyone’s attitude towards it would be different... it's not just about learning medicine and how to examine, and how to diagnose, it’s learning about a population and how we can reduce [health risks].”  
| Phase 4 student |  
| Some junior students lacked role legitimacy | “I did [my online course]... in the middle of my chest rotation and I didn’t use any of it. Partly because of not being that confident to do it and partly because of as you say being someone our age kind of cramming advice down people’s necks is a little bit off putting especially when you are working so hard to try and be nice to people.”  
| Phase 3 student |  
| Others felt even junior students could have a role | “I have to say I don’t agree it doesn’t feel like it’s my place to talk to them... because I think as students we have more time to talk to patients than anybody else.”  
| Phase 3 student |  

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<th>Theme 2: role competency</th>
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| The online course increased students’ confidence and competence | “I feel a lot more confident to actually say to somebody have you ever thought about stopping smoking... now I can ask, and if they come back with an answer then I know what to do...”  
| Phase 3 student |  
| “I use to give the wrong advice up until now, like when you are trying to get people to stop smoking you give your own methods ... and now I've learnt that doesn't work.”  
| Phase 3 student |  
| “...like today, my patient came in with like tonsillitis and they were smoking ... and I was like ‘have you considered smoking cessation?’ ...and if I hadn’t done the part one I certainly wouldn’t have known what medication he was referring to.”  
<p>| Phase 5 student |</p>
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<th>Some worried about skills atrophy without opportunity to practise</th>
<th>“…we’re much more likely to remember things from the course if we practice them soon after we learnt them… So maybe like a half day… at a smoking cessation clinic, we spend so much time in other clinics… half a day and that would probably consolidate it then.”</th>
<th>Phase 4 student</th>
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<td>Senior students consolidated learning during health promotion reviews</td>
<td>“In fourth year you have to [do a] healthy living lifestyle [review] you have to pick one programme and mine was stop smoking. So I actually found out about all the council things that are available… you’ve got all the booklets and leaflets that people are given… and I had to give a 10 minute presentation on stopping smoking in the community.”</td>
<td>Phase 5 student</td>
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<td>Some students studied in depth, others studied strategically to the test</td>
<td>“I went through it quite thoroughly, going through each of the sections. I think it took me two to three days [to complete the course].”</td>
<td>Phase 4 student</td>
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<td>“I took the test first, so in total about an hour spent on [the course].”</td>
<td>Phase 3 student</td>
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<td>“There seem to be two different ways of doing the certificate. I mean I presume you were just finding the specific answers in the text, is that right?”</td>
<td>Phase 5 student</td>
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<td>Theme 3: cognitive dissonance</td>
<td>“It made me think about why I didn't know this already … why have I not had the training?...I got in touch with the smoking cessation co-ordinator and that’s when I discovered the difficulties in implementing hospital-based smoking cessation and interventions…It was an eye opener for me … realising that it's not actually implemented… in the big hospitals… that was interesting for me.”</td>
<td>Dentist converting to maxillofacial surgery</td>
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<td>“I'm just about to start my chest rotation next month, so I am definitely glad that I have done this before hand and I'll try and get my clinic departments to do it too... (Laughter)...”</td>
<td>Phase 3 student</td>
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<td>“I know that my hospital placements in year five… I know that there have been patients who’d come in and they had been smoking, but nobody’s really spoken to them about it.”</td>
<td>Phase 5 student</td>
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<td>“It’s definitely easier in general practice… but back in the hospital it’s just like go and see your GP (laughs)… and you don’t really know what’s available here, and my impression… is no one is really interested in facilitating that in the hospital.”</td>
<td>Phase 5 student</td>
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Table 3: data from phase 4 student feedback regarding 2014 health promotion reviews

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<tr>
<th>Theme 1: role legitimacy</th>
<th>“It was beneficial to be able to put what we learn into context.”</th>
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<tr>
<td>Students valued learning</td>
<td>“I learnt what the Smoke Free Programme was all about and the offers and services they provided”</td>
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<td>“We learnt about GP community practice and we learnt about smoking cessation”</td>
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<th>Theme 2: role competency</th>
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<tr>
<td>Students learnt about community services</td>
<td>“We suggested that the GP Practice joins the Smoke Free Programme. Not only would this give better assessment and values for recording for the practice but will also be highly beneficial to their patients who do smoke. The nearby practices are involved and we showed the benefit and the success of their smoking cessation since joining the programme... the practice requested a copy of the slides.”</td>
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<td></td>
<td>“It also enables us to critically assess the functioning of the GP practice... in terms of what smoking cessation services they provided and how efficient they were.”</td>
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<th>Theme 3: challenging norms</th>
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<td>Students were agents for change</td>
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Obesity
Analysis of early reflective case studies on consultations with obese patients from 2011-12 by final year medical students indicated barriers to effective practice centring on two main areas: role legitimacy and role competency (see table 4). Without role legitimacy, students were unlikely to attempt behavioural change, and without role competency, students were likely to attempt but not to achieve behavioural change.

Analysis of GP tutor pre-training questionnaires indicated a third category: resource adequacy (time, effective treatments, and quality referral options) that was less apparent from the student case studies.

Role competency was addressed with campus-based teaching and role play, including strategies and rationale for broaching obesity, patient-centred partnership approaches, evidence-based resources, and adapting prior knowledge on behaviour change counselling to obesity including motivational interviewing.

Role legitimacy was addressed through lectures, demonstrating successful behaviour by peers, and GP tutor training. Resource adequacy for GP tutors was addressed with strategies for efficient and critical use of local resources. GP tutors were encouraged to see their allocated medical students as potential contributors.

Analysis of the most recent case studies from 2013-14 (table 5) indicates that many students are now aware of and or actively addressing the social determinants of health when discussing obesity with their patients, and are adopting patient-centred partnership approaches to behaviour change resulting in productive consultations.

During 2013 a third of the GP tutors (N=60 of approx 180) involved with final year teaching attended a full day workshop about addressing obesity in a consultation and approaches to teaching. They were surveyed pre- and post-workshop and 7 and 12 months follow up and another purposive sample of student case studies at trained practices were analysed.

- GPs reported greater confidence in teaching about obesity and using evidence based approaches in clinical practice
- GPs considered primary care an appropriate place for addressing obesity
- Students at trained practices felt confident broaching the topic with patients, and had been assisted to use the framework they were taught as a guide to the consultation
- Students reported having positive rapport with patients whether obesity was broached opportunistically or related to the presenting problem
- Practice based protocols based on NICE guidance are available in a minority of teaching practices but students are encouraged to use their SSCs and health promotion projects to support this
- Practices and students are aware of and using local referral options

The data confirms that the GPs have role legitimacy in addressing obesity but their confidence with regards to teaching students about SDH and behaviour change, and their knowledge of local social prescribing resources was variable. The data suggests teaching senior medical students creates an impetus for GP tutors to develop these skills and protocols, and our research indicates that training GP tutors in parallel to medical students is an effective means of supporting both the role legitimacy and role competency of students.

“[I am] more confident in my own approach to broaching .... Has driven some discussions with others in the practice and students about identifying and engaging with obese patients and how to have those difficult discussions”

GP tutor 7 month post-training follow-up
Table 4: barriers to effective practice on obesity (2011-12 cohort reflective obesity case studies by final year medical students)

<table>
<thead>
<tr>
<th>Theme 1: issues with role legitimacy</th>
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<tr>
<td><strong>Judgemental attitudes</strong></td>
<td>“I personally find it frustrating to advise patients on the risk factors of obesity if they feel apathetic or are not willing to improve.”</td>
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<tr>
<td><strong>Fear of offence</strong></td>
<td>“One of the things that worried me was how I would broach the subject of the patients’ weight without disrupting rapport.”</td>
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<tr>
<td><strong>Despondency</strong></td>
<td>“there is not much we, as clinicians, can do apart from explain the risks to themselves”</td>
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<tr>
<th>Theme 2: issues with role competency</th>
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<tr>
<td><strong>Poor knowledge of evidence base</strong></td>
<td>“I also found that Mrs S had a negative attitude… [she] felt that her ideal weight of 58.9kg (she currently weighs 120kg) was completely unachievable.”</td>
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<tr>
<td><strong>Lack of behaviour change skills</strong></td>
<td>“I would be more inclined to have a paternalistic view on obesity, in order to ensure that the exercises and dietary plans were being taken seriously and used.”</td>
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<tr>
<td><strong>Lack of knowledge of resources to support self-care</strong></td>
<td>“knowing which health professional to refer the patient to was an issue, and knowing which support groups are available in that specific area seems to be a problem”</td>
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<thead>
<tr>
<th>Theme 3: avoidance of dissonance</th>
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<tr>
<td><strong>Influenced by current norms</strong></td>
<td>“During my first week at my practice sitting in clinics I did not see my GP discuss weight… I therefore talk about weight only when a patient requests help.”</td>
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</table>
Table 5: After modified teaching on obesity, including tutor training (2013-14 cohort reflective obesity case studies by final year medical students)

| Theme 1: role legitimacy | "I have taken this experience and used it in my consultations after the encounter with Mr. XY. I am more confident in asking this question and, so far, I have not yet met anyone who would get offended by being asked about their weight."
| | "I also learnt that people are quite happy to talk about obesity and weight loss. It is not a taboo subject and an open and honest discussion can lead to a management plan that the patient can agree to and is more likely to follow."
| | "By continuing to raise this issue during the consultations, I already feel more confident to do so in future and believe that the key here is to practice until it feels as normal as asking ‘what’s brought you here today?’"
| | "I feel that health professionals do often not do discussing weight concerns with patients as we become scared that they will disengage or become angry. It seems that this is untrue as the majority of people will at least take on board what you say and many will want to take positive action."
| Some still struggled to broach obesity | "There are clear guidelines for both hypertension and obesity, and I unfortunately failed to address the arguably more important causative factor in this case... This is because topics such as weight are deemed to be ‘personal’, and even in the clinical setting, it still felt more of a personal topic than a health issue."
| Students reported an awareness of SDH and patient-centred approaches | "[The NICE guidelines on obesity are] a helpful starting point but I think for some patients with obesity there are underlying social and psychological problems that should be addressed to give a patient the best opportunity to change their behaviour."
| | "I learnt a patient is not a diseased pancreas, liver or heart but in fact people want to live as normal a life as possible even with multiple comorbidities and as doctors we should keep that in mind when treating a set of symptoms."

Theme 2: role competency

| Students valued and used the techniques they were taught | "During our campus block teachings, we were given frameworks... it helped structure my history taking on weight issues, a topic I have never had the confidence to broach with a patient before. I can only imagine the challenge the consultation could have been had I not had the tools mentioned above to use, and had the patient not been as forthcoming as she was."
| | "This structured dialogue... felt natural, appropriate and sensitive, and allowed for detailed discussion within this context that is notoriously difficult to bring up in a consultation – perhaps due to the fear of offending or upsetting the patient, or simply from embarrassment from the interviewer."
| | "The... tool made me feel more confident and helped me think of how to phrase questions without sounding rude."
| | "I felt setting realistic goals for him and ensuring that those goals were
followed-up was a crucial part of his management.”

“He admitted that people hadn't really taken the time to talk to him in depth about his weight problems, and as the consultation drew to a close he thanked me and told me that he was going to make extra efforts to lose weight, rather than relying on the surgery as a 'cure'.”

“...he had lost over a kilogram since I had last seen him; considering that for the last several years his weight had been steadily increasing, I felt that I could take some small degree of victory from this case...”

“I was also pleased to see he had lost 1 Kg in weight during this time by implementing some of the changes we had agreed on... I found this case both difficult and interesting as the underlying cause of his obesity, his shift work, was something that cannot itself be changed.”

Theme 3: positive social modelling
Some practices were engaging with SDH

“Apart from focusing on patients, the practice have had some success in encouraging local businesses on high street to label calorie information on their food. Posters are being displayed around the surgery to reinforce 5 a day healthy eating.”

“My GP tutor explained to me that he went on an Obesity Management course organised by GKT recently ... and since he has had this knowledge, one service which teaches people to cook in a more healthy way, has gone from being on the brink of closing to being oversubscribed.”
Global health
As part of the phase 4 students’ preparation for electives, students attend a global health symposium and are required to write a global health essay. Data were gathered and analysed from symposia evaluation (purposive sampling) and samples of essays, 10% (systematic random sampling) for 2012, 2013 and 2014 (N= 40 x 3), and 30 samples from 2014 cohort based on marks distribution, feedback from 2014 student cohort and faculty markers. Each year approximately 43% of the cohort will spend all of their elective placement in low and middle income countries, 38% will spend half of the their elective in low and middle income countries and half in high income countries and 19% in high income countries only. The data suggests students have insights into the key concepts of global health. The range of topics overall was very comprehensive, with students frequently taking an issue and looking at it globally with links to human rights, inequalities and health care systems, and reflecting on how it relates to their planned elective destination. They referred in many cases to their forthcoming electives regardless of destination, finding global health concerns in countries of all income brackets.

I found it particularly interesting to evaluate the literature
This was great way to explore pertinent public and global health issues
I have learnt a lot… the symposia days were really good… they should be compulsory

Phase 4 students, quotes from course feedback

A minority of students did not draw on global health concepts but wrote about their planned overseas elective or about the biomedical aspects of an infectious disease. Some of these essays were articulate and succinct but were marked down if they did not relate to the key global health concepts. The faculty essay markers (n=18), with about 25 scripts each to mark, gave free text comments on their experiences and below is typical:

“The Global Health essays showed a wide range of abilities and some of the students had not quite understood the definition of Global Health. Some students wrote good essays about their electives without putting it in the context of Global Health... some of the essays were outstanding and worthy of publication while others were only adequate and not well constructed or referenced. My impression was that there were a number of essays on FGM which is obviously a very current issue for students to be aware of.”

Feedback from faculty marker

Female genital mutilation (FGM) was the focus of one of the global health symposium workshops, which was offered on four occasions with about 27% of the cohort participating and enabled students to see the various concepts of global health being relevant such as health inequalities, human rights and ethical dilemmas.

The data suggests that student engagement with SDH in a global context is generally positive, with students valuing the opportunity to research and write about a topic of interest to them. Linking the essays to their elective preparations, gave relevance and focus to their learning, however some students had not moved beyond the biomedical aspects of disease to consider how the societal, cultural and political environment impacts on health and healthcare.

Discussion
Students felt that smoking cessation was central to their role within modern healthcare, but experienced a dissonance between this cognitive role and observed behaviour and were critical of institutions where this was not prioritised. Students were interested both in smoking cessation skills and in the audit and provision of smoking cessation services, showing an understanding of the healthcare environment in supporting behaviour change. Some students were motivated to take an active role in supporting institutional change. The online NCSCT course was a simple and effective way of promoting role competency on this subject to a large
student cohort. Uptake of this course was facilitated by organising incentives through certification for students, increasing the simplicity of course registration, and through regular verbal and newsletter reminders. Students argued that this should be compulsory and assessed at every level. Students felt that skills needed to be built on and used so that they did not atrophy. This was addressed through health promotion review projects, SSC opportunities, a health promotion focus to their longitudinal pregnancy study, and through engagement of students in hospital-based smoking cessation services, as well as practical experience during their GP rotations in their final year.

Data initially identified many barriers to broaching conversations about obesity with patients, and suboptimal skills in facilitating partnership approaches to behaviour change. Learner needs were addressed through campus based teaching on patient-centred broaching techniques and motivational interviewing including role play. Students were strongly influenced by GP tutor role modelling, both positive and negative, and tended to resolve cognitive dissonance through adopting what they perceived as the norm rather than challenging it. GP tutor training was subsequently provided in order to encourage more consistent social modelling of behaviour to students.

Student case studies indicate that once students have broached obesity successfully, they become increasingly confident in their role facilitating change where possible, with some students reporting successful outcomes with patients within their eight GP week rotations. The compulsory reflective case studies were an effective way of promoting self-efficacy in student learning.

Global health essays predominately showed in-depth awareness and knowledge about global health themes and SDH. This may not be surprising given the essays were summatively assessed and students generally want to do well in the few written and assessed assignments they have. However a minority of students were still unable to discuss issues beyond the biomedical aspects of disease. The main improvements in response to teaching has been the numbers of students able to raise issues and show insights around ethical electives, complex global mental health issues, health care systems, health inequalities and how such awareness would be directly relevant to their electives and career plans be they overseas or UK based.

Limitations
This research has a number of limitations that need to be highlighted but nevertheless may not be a barrier to other institutions adopting and or adapting aspects of the work.

There is inherent bias given the work was done at one, albeit large, institution and the researchers were involved in delivering the teaching, though not in gathering the data. There can be limited confidence that the observed changes in student attitudes and behaviours were directly linked to curriculum modifications and stated learning outcomes, with the informal and hidden curricula possibly having a stronger influence than the formal curriculum (Cribb and Bignold, 1999).

Conclusions
This action research project, involving over 2500 students across three years and many committed medical teachers, mainly from primary care, has resulted in an established programme that addresses health behaviours and the social determinants of health, with accompanying resources and assessment. The content is based on current best practice and evidence-based clinical and educational guidelines.

Whilst initially there was some resistance to change, GP tutors have now adapted and appreciate many of the benefits. For them the changes have included modified student placements in Phases 3, 4 and 5 which require the practices to manage preparation and logistics and to maintain their own training for this teaching. Despite the large student cohort and some difficulties overall these changes have proved sustainable and are valued, with many GPs reporting direct benefits and praising the quality of work students have done. Students themselves have been contributors to the dissemination of best practice and a small number have had additional academic opportunities.

The implementation of this content into core curriculum has to some extent been opportunistic, but adopting a coordinated approach across three years has avoided fragmentation, and allowed for spiral re-enforcement of
core ideas, skills and concepts. It has taken a number years, and has required attention to process and outcome evaluation following action research methodology including the use of pilot studies. This methodology has enabled the SDH and behaviour change content to remain open to constant review and adaptation.

Enabling qualifying doctors to have skills and knowledge related to SDH is accepted as an imperative (Gourevitch, 2014) but can be challenging for medical educators and curriculum developers partly because of the eclectic nature of the topics and content. Equally, changes to learning outcomes and curriculum content require suitably prepared and engaged medical teachers. Acknowledging and addressing these two important elements together has enabled SDH to be integrated to this core curriculum with minimal cost and disruption and with additional benefits in some instances to patients, students and clinicians. Research and further data analysis continues.

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Notes on contributors

Dr Ann Wylie has been developing and researching health promotion and social determinants of health into core curricula for many years and has been a public health specialist. Her work focus includes enabling students to be contributors to research and curriculum development in the discipline.

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