INTRODUCTION

Book clubs provide an opportunity for discussion in an informal setting, enhancing communication skills, confidence, and knowledge. A book is nominated, and after a period allocated to reading—around four weeks—a group of readers meets to consider the merits of the publication. Book clubs have increased significantly in number over the past few years, encompassing both generalist and specialist topics. In science education, book clubs have been used to encourage science literacy and critical reading skills in medical students (2), and have been successfully employed as assessed components of undergraduate microbiology courses (1).

The Bad Bugs Book Club was launched in 2009. The intention was to engage scientists and non-scientists in discussion about novels where infectious disease forms part of the plot, with the aim of enhancing learning about microbiology. Discussion, led by one member of the group, focuses on enjoyment of the novel, accuracy of the science, relevance to contemporary issues in microbiology, and the potential value of the novel for more overt educational purposes. Meetings are held around six times per year, often taking place on particular days in the microbiology calendar (e.g. World AIDS Day), enabling complementation with public engagement events.

In an educational environment, the audience for the book club would be undergraduate students, in a classroom or more informal environment, with the instructor leading the discussion. The meetings can be assessed formatively or summatively. Opportunities to enhance student learning by modifying the meeting format are wide-ranging: questions can be devised to satisfy the instructor’s intended learning objectives; students can lead their own book club with peers, in the absence of an instructor; they can join a discussion with non-scientist members of the general public; and help develop, deliver, and evaluate any complementary public engagement activities.

PROCEDURE

Bad Bugs Book Club—open membership

The first meeting of the book club took place during National Science and Engineering Week (March) 2009. Using a range of e-mail lists, invitations were made to a screening of the movie Outbreak alongside reading of the novel Hot Zone and facilitated discussion around emerging diseases. From this initial meeting, a book club membership was established. A typical meeting comprises between five and 10 participants.

Meetings are held around six times per year, with efforts made to tie novels in to different events in the microbiology calendar (Table 1). In preparation for a book club meeting, a novel is agreed upon by the membership at a previous meeting—or is nominated by the book club leader. Meetings take place in the early evening in various venues around the city center. Discussion is led by the book club leader, or the nominator of the novel. For every book, a meeting report (narrative of discussion) and reading guide (suggested questions for discussion, and activities for microbiology research) are posted on a dedicated website (www.hsri.mmu.ac.uk/badbugsbookclub). Book club meetings have also been hosted at microbiology conferences (e.g. ASMCUE, Society for Applied Microbiology summer meeting).

Bad Bugs Book Club—student project work

Final-year undergraduate student projects can be laboratory focused or they can be a dissertation (a critical narrative of a topic identified with the supervisor, such as a meta-analysis, of up to 9,000 words; 200 hours of student effort). The book club provides an education focus to project work, and several students, particularly those with an interest in a teaching career, have selected this option. They have selected novels which complement a public engagement activity, provided a critical analysis of the novel and its microbiology, run their own book club events, and developed, delivered, and evaluated the accompanying public engagement activity.

This paper describes the planning of typical book club meetings, describes some of the books already used, and offers suggestions and recommendations for extension work.

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engagement activities. The final dissertation then includes the typical introduction, method, results, discussion, and conclusion sections of the investigative paper (Table 2).

**Bad Bugs Book Club—student learning exercise**

To date, the book club has not been used as an assessment tool. However, for 2012–2013, four novels have been selected for discussion in tutorial format for a group of 150 medical microbiology students, as a formative assessment exercise (*I am Legend* by Richard Matheson, *The Immortal Life of Henrietta Lacks* by Rebecca Skloots, *Nemesis* by Philip Roth, and *Microbe Hunters* by Paul du Kruif). The students have been divided into eight groups, with two groups each reading the same novel. To date, the activity has been successful, with excellent attendance and participation, enabling wide-ranging discussion of the novel and related microbiology.

**CONCLUSION**

The Bad Bugs Book Club has been a success in terms of member enjoyment, the club’s longevity, complementation

### TABLE 1. Public engagement activities associated with selected book club meetings.

| Title/Author/Genre | Topic | Associated Activity |
|--------------------|-------|---------------------|
| *Year of Wonders*/Geraldine Brooks/Historical fiction | Plague outbreak in Derbyshire village in 15th century. | Guided walk around Eyam (plague village). Manchester Science Festival. |
| *Dorian*/Will Self/Contemporary fiction | Parallel of novel ‘Picture of Dorian Grey’ using HIV/AIDS to represent the hidden deterioration. Set in 1980s, thus a little dated. | Community AIDS quilt and facilitated discussion around TV documentary by Stephen Fry ‘HIV and me.’ World AIDS Day. |
| *The Andromeda Strain*/Michael Crichton/Science fiction | Science fiction potential pandemic. | Film screening. |
| *Mary Barton*/Elizabeth Gaskell/Classic | Public Health and the poor in 19th century Manchester. | Guided walk around Manchester. Manchester Science Festival. |
| *The Calcutta Chromosome*/Amitav Ghosh/Fantasy/Historical fiction | The discovery of mosquitoes as vectors of malaria, in novel across time periods. | Sunday afternoon event with songs, games, displays and information. World Malaria Day. |
| *The Island*/Victoria Hislop/Historical fiction | Leprosy in Greece in 20th century. | Meal in Greek restaurant. World Leprosy Day. |
| *The Street Philosopher*/Matthew Plampin/Historical fiction | Cholera in Crimean war and Great Exhibition in 19th century Manchester. | Correspondence with author to facilitate discussion. World Water Day. |
| *The Satan Bug*/Alistair Maclean/Science fiction | Science fiction potential pandemic. | Film screening. |
| *28 stories of AIDS in Africa*/Stephanie Nolen/Non-fiction | Individual stories, but slightly dated due to significant changes in treatment. | Exhibition of Manchester Metropolitan University community quilt in People’s History Museum. World AIDS Day. |
| *I am Legend*/Richard Matheson/Science fiction | Zombie/vampire pandemic and microbiological investigation. | Screening of three film versions on consecutive nights. Manchester Science Festival. |
| *World War Z*/Max Brooks/Science fiction | Zombie pandemic apocalypse | Range of activities focusing on epidemiology (pub quiz, mathematical modeling, talks). Manchester Science Festival. |

### TABLE 2. Student project work.

| Title/Author/Genre | Activity |
|--------------------|----------|
| *AIDS Sutra*/Amartya Sen/Non-fiction | For World AIDS Day. Development of posters to accompany Manchester Metropolitan University AIDS Community quilt as backdrop to event; assemble peer group; discuss novel and produce meeting report and reading guide. |
| *Twilight*/Stephenie Meyer/Fantasy | For Children’s Book Festival. Biology lab scenario, readings, discussion and demonstration of disease transmission (contact). |
| *Children’s Zombie books* | For Children’s Book Festival. Epidemiology lab scenario and prevention strategies coupled with mathematical modeling of outbreaks, using children’s zombie novels as inspiration. |
with public engagement activities, and stimulation of student interest (and that of the general public). In addition, since the focus of the book club is infectious disease, reading material can represent any genre, enabling a range of literature to be scrutinized (Table 3). Indeed, the focus of any similar book club need not be specifically microbiology.

However, the potential of the book club for implementation across disciplines within the student population, for a more formal and summative student assessment, and for audience reach have not been exploited to date. Social media—blogging, Facebook, Twitter—have been significantly under-utilized, and will be the focus of future work.

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**TABLE 3.**

Books discussed across range of genres.

| Title/Author | Description and Genre |
|--------------|------------------------|
| The Air We Breathe/ Andrea Barrett | Tuberculosis sanatorium in America early 20th century. Historical fiction. |
| Arrowsmith/ Sinclair Lewis | Pulitzer Prize winner, man driven by desire to do research in 1920s. Historical fiction. |
| Intuition/ Allegra Goodman | 1970s research laboratory discovery of respiratory syncytial virus treatment for cancer, and subsequent downfall. Thriller. |
| The Painted Veil/ W. Somerset Maugham | Cholera in China in early 20th century. Historical fiction. |
| Star of the Sea/ Joseph O’Connor | Irish Potato famine, potato blight and emigration to America. Historical fiction. |
| Toxin/Robin Cook | E. coli O157 outbreak and issues associated with cover-up. Thriller. |
| The Immortal Life of Henrietta Lacks/ Rebecca Skloots | The discovery of HeLa cells, their impact on science, and the life of the Lacks family. Non-fiction. |
| The Body Farm/ Patricia Cornwell | The science of the decay of the human body and impact on forensics. Crime fiction. |
| Unnatural Exposure/ Patricia Cornwell | Engineered virus related to smallpox causes outbreak in America. Crime fiction. |
| Nemesis/Philip Roth | Polio in New Jersey in mid 20th century. Historical fiction. |