

Infection Control and Hospital Epidemiology

Blogging in infectious diseases and clinical microbiology: Assessment of the 'blogosphere' content.

--Manuscript Draft--

Manuscript Number:	36993R1
Full Title:	Blogging in infectious diseases and clinical microbiology: Assessment of the 'blogosphere' content.
Short Title:	Blogging in infectious diseases
Article Type:	Original Article
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Abstract:	Objective. To analyse influential infectious diseases, antimicrobial stewardship, infection control, or medical microbiology blogs and bloggers. Setting. World Wide Web Design. We conducted a systematic search for blogs in accordance with the PRISMA guidelines in September 2015. Methods. A snowball sampling approach was applied to identify blogs using various search engines. Blogs were eligible if they: 1) focused on infectious diseases (ID), antimicrobial stewardship (AMS), infection control (IC), or medical microbiology (MM); 2) were intended for health professionals, 3) were written in English. We mapped blogs/bloggers characteristics and used an innovative tool to assess their architecture and content. Motivations and perceptions of bloggers and readers were assessed. Results. A total of 88 blogs were identified. 28 (32%) focused on ID, 46 (52%) on MM and 14 (16%) in IC or AMS. Bloggers were mainly male, MD and/or PhD, 32 (36%) posted at least weekly, and 51 (58%) for a research purpose. The aims were considered clear for 23 (26%) blogs, the field covered was broad for 25 (28%), presentation was good for 22 (25%), 51 were easy to read (58%) and 46 included expert interpretation (52%). Among the top 10 blogs (2 equally-ranked), 3 focused on ID, 6 on MM and 2 on IC. Bloggers questioned were motivated by sharing independent expertise/opinion. Readers appreciated the concise messages given on scientific and practical updates. Conclusions. This study describes high level blogs in ID/IC/MM suggesting how bloggers should build/orientate blogs for readers, and highlighting current gaps in topics such as AMS.

Blogging in infectious diseases and clinical microbiology:

Assessment of the ‘blogosphere’ content.

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Previous presentation: A poster summarizing the results of this study has been presented at
the SHEA 2016 conference, Atlanta

Running title: Blogging in infectious diseases

Word count: 3020

ABSTRACT

Objective. To analyze influential infectious diseases, antimicrobial stewardship, infection control, or medical microbiology blogs and bloggers.

Setting. World Wide Web

Design. We conducted a systematic search for blogs in accordance with the PRISMA guidelines in September 2015.

Methods. A snowball sampling approach was applied to identify blogs using various search engines. Blogs were eligible if they: 1) focused on infectious diseases (ID), antimicrobial stewardship (AMS), infection control (IC), or medical microbiology (MM); 2) were intended for health professionals, 3) were written in English and updated regularly. We mapped blogs/bloggers characteristics and used an innovative tool to assess their architecture and content. Motivations and perceptions of bloggers and readers were assessed.

Results. A total of 88 blogs were identified. 28 (32%) focused on ID, 46 (52%) on MM and 14 (16%) in IC or AMS. Bloggers were mainly male, MD and/or PhD, 32 (36%) posted at least weekly, and 51 (58%) for a research purpose. The aims were considered clear for 23 (26%) blogs, the field covered was broad for 25 (28%), presentation was good for 22 (25%), 51 were easy to read (58%) and 46 included expert interpretation (52%). Among the top 10 blogs (2 equally-ranked), 3 focused on ID, 6 on MM and 2 on IC. Bloggers questioned were motivated by sharing independent expertise/opinion. Readers appreciated the concise messages given on scientific and practical updates.

Conclusions. This study describes high level blogs in ID/IC/MM suggesting how bloggers should build/orientate blogs for readers, and highlighting current gaps in topics such as AMS.

INTRODUCTION

Scientific knowledge in the field of infectious diseases is in constant evolution. Emerging and evolving organisms and methods of diagnosis, prevention, or treatment keep this field in a state of flux.¹ During the last decade, healthcare professionals (HCPs) worldwide have dealt with the challenges of H1N1, MERS-coV, Ebola and Zika, and are increasingly encountering antimicrobial resistance, now considered a ‘crisis for humanity’.²

The Internet presents a universal gateway and easily accessible channel of information retrieval and communication on medical or scientific topics. With conventional websites, the flow of information is formal and unidirectional. The development of platforms such as ‘blogs’ have opened a great range of possibilities for HCPs worldwide to share information and experiences.³

HCPs are proactive in the field, writing more than half of all blogs related to health.⁴ The exponential growth in the number of blogs and other social networks (such as Twitter, YouTube, and Facebook) with potential relevance to healthcare makes them worthy of consideration and analysis by healthcare systems as a potentially cost-effective option to communicate, educate, and engage HCPs with their peers worldwide or even for diseases surveillance.⁵⁻⁷

This collective intelligence network provides interactive services on a certain topic such as infectious diseases, infection control, microbiology and epidemiology. In these fields, blogs can serve as educational tools, opportunities for reflection, information collators on emerging situations, or discussion around current controversies.⁸ Despite potential interests, the exploration and analysis of the infectious diseases ‘blogosphere’ remains weak.

This article aims to: (i) describe the existing landscape of existing blogs for HCP in the field of infectious disease diagnosis, prevention and treatment, (ii) assess their content

through a quality criteria tool, (iii) analyze their impact, interest and influence from the blogger, and HCP point of view.

METHODS

This study was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines.⁹

Search strategy

We conducted a systematic search for blogs in Google, Yahoo, Bing and the blog aggregator “Searchblogspot”. The last search was run to October 6, 2015. Search terms (Appendix 1) covered (i) infectious diseases (endemic or emerging), (ii) antimicrobial stewardship, (iii) infection prevention and control, and (iv) medical microbiology. In addition, the blogrolls (lists of related blogs or websites) of all selected blogs were scanned to derive any further relevant blogs.

Blog selection

All blogs that focused exclusively on infectious diseases, infection prevention, treatments and microbiology (bacteriology, virology, parasitology, mycology) topics were considered. Blogs were eligible for analysis if they: focused on human medicine, were written in English, and had included at least one new post in the 6 months prior to data collection for this study. Blogs on veterinary medicine, with a clear commercial purpose, or clearly targeted at patients were excluded.

We used a snowball sampling approach to identify infectious disease related blogs from keyword searches in various search engines and blog aggregators.¹⁰ This approach is especially appropriate for studying blogs.^{11,12} We reviewed the top 200 search engine results for all preselected keywords. This method has been previously described to give the most frequently linked blogs, as a proxy measure of its influence.¹¹ From the blogrolls provided by these blogs we identified additional blogs to consider for inclusion.

Data collection

Architecture and content evaluation were undertaken for all blogs arising from the web search, with subsequent full content analysis and quality assessment of those blogs fulfilling the inclusion/exclusion criteria. Two authors (GB and RT) independently reviewed the blog architecture and content. Disagreements were resolved by a third person (LM). A data extraction form was developed and validated on 10 randomly selected blogs. Data from the included blogs were recorded by two reviewers (GB and RT) then subjected to further critical appraisal during a narrative synthesis.

Blog architecture

Data extraction included quantifying objective measures through blogger characteristics and blog architecture. Demographic information including the blogger gender, country, occupation, and education were extracted. Blogger's age was either extracted if available or independently categorized in age groups (10 years ranges) by the two reviewers using available data. Blogs architecture was assessed using nine criteria listed in Table 1.

Blog content

The content of blogs and posts were explored using nine quantitative and qualitative criteria. (Table 1) We identified topics discussed by reading blog descriptions and posts, and we coded the primary purpose of each blog. The practical or research purpose of blogs was independently categorized by the two reviewers and discussed in case of inconsistency. Features included the frequency and regularity of posts during the month preceding data collection and the date of publication of the last post. The traffic rank of the blog was estimated using Alexa (<http://www.alexa.com/>).

A qualitative assessment was also performed for five criteria: clear statement, overall presentation, the level of analysis on post topics, and the ease of reading. These were scored using a Likert scale varying from 1 for a poor evaluation to 5 for high evaluation. Agreement was considered if the two reviewers reported the same score or for a difference not exceeding one point. If the scores differed by more than one point, the third reviewer assessed the blog and an average of the three scores was taken. Finally, the field covered by the blog was categorized according to the number of topics (described above) covered, as follow: Narrow if constrained by geographic area, particular pathogen type, or only relevant to a small group of professionals, medium if relating to a general field e.g. mycology or bioinformatics, and broad if information is generally relevant to HCPs or researchers in infectious diseases.

Quality assessment tool

A tool was developed to evaluate the quality of blog architecture and content including 17 of the 19 criteria described above. A score was derived by attributing one point for each item present. Points for seven items considered of high importance were multiplied by a factor two (Formula in Appendix 2). The final score scale could vary from 0 to 72. The

1 developed tool was compared with the “Quality Checklists for Health Professions Blogs and
2 Podcasts” previously published in terms of acuity and comprehensiveness.¹³
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7 *Perception of bloggers and readers*

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9 Perceptions of bloggers were qualitatively assessed using an online survey directly
10 emailed to bloggers and including ten open questions on their motivations, vision and
11 perceived impact of their blog for readers and themselves (Appendix 3). For readers, 10
12 questions were asked on their habits regarding blogs (how often they comment/share, what
13 they like about blogs) and preferences about blog topics and content. They were contacted
14 either directly or indirectly through bloggers posts, or via the website and newsletter of the
15 European Society of Clinical Microbiology and Infectious Diseases.
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29 **Data analysis**

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34 For categorical variables, chi-square tests or Fisher’s exact tests, as appropriate, were
35 performed. For continuous variables, the median and inter-quartile range (IQR) were used to
36 describe the data and Student’s t-test or Mann–Whitney U-test, as appropriate, to compare
37 values groups. These analyses were performed using Stata release 10.0 (Stata Corp LP,
38 College Station, TX). All P values were two sided, and P values <0.05 were considered
39 significant. The analysis of blogger and reader answers was performed using NVivo 10
40 software (QSR International Pty Ltd, Australia).
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RESULTS

Blog selection

Electronic and subsequent manual searches identified 326 blogs selected based on the first page content. Among these, 207 were excluded based on the inclusion/exclusion criteria described above (141 last post > 6 months, 19 incorrect topic, 17 commercial, 16 made for audience other than professionals, and the remaining were not blogs, closed or not in English language) leaving 88 blogs for analysis. (Figure 1) Half (46, 52%) of the blogs selected focused on microbiology (more specifically 9 on bacteriology, 2 mycology, 8 parasitology, 9 virology), followed by 28 (32%) on infectious diseases (9 on specific topics), 7 (8%) on infection prevention and control and 7 (8%) on antimicrobial stewardship. (Table 2)

Blog and blogger characteristics

The average age of the 88 blogs we analyzed was 4.7 years (SD 2.8) and ranged from 0.5 to 11 years. 55% of them had been maintained for more than five years after their creation. Blogs were mainly based in USA (44, 51%) and United Kingdom (15, 18%). Most blog architecture contained external links (83%), archives (69%), links with social media (72%), pictures (78%) or space for comments (78%). Blogrolls, audio and video were infrequent. Blogs were maintained by individual professionals (67%), organizations (14%), universities (4, 5%) or non-commercial journals (3, 3%).

Table 2 displays blogger demographics and background. Among the 72 bloggers with available data, the majority were male (50, 69%), aged in their 30s (20, 32%) or 40s (16 (25%). Bloggers had a PhD +/- MD in 36/67 (54%) cases, and 10 (15%) held a Master's

1 degree. Bloggers were academics in 25 (36%) cases, clinicians in 33 (48%) cases and both
2 for 19 (28%) cases. We found information on the worldwide traffic rank for 65 blogs. Among
3 these, the median rank was 4.9 million (0.9-10.4 million).
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9 **Quality of blog content**

10 Overall, 51 (58%) blogs centered on research purposes whereas 30 (34%) had a more
11 practical approach with a clear implication in routine practice. The spectrum was considered
12 narrow for 32 (36%) blogs and broad for 25 (26%) blogs. The in-depth analysis of content
13 showed that 26 blogs focused on one specific topic, such as a particular disease or
14 geographical area.
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17 Bloggers posted weekly or monthly for 33 (37%) each, representing 74% of all blogs.
18 A few posted daily (9, 10%). The blogs aims were considered clear for 24 (26%) blogs, the
19 field covered was estimated broad for 25 (29%), presentation was good for 22 (25%), 52
20 (60%) were easy to read and 46 (53%) included expert interpretation. (Figure 2) The median
21 overall score obtained by blogs was 49 out of 72 (interquartile range: 41-55, min: 23, max:
22 64.4). Blogs with a high quality level (4th quartile in the distribution of scores) included
23 pictures, video, blogrolls, guest posts by experts in the field, a high frequency of posts, a clear
24 statement and an opinion/analysis given by bloggers. Among the top 10 blogs (2 equally
25 ranked), 3 focused on ID, 6 on microbiology, and 2 on IC. (Table 4) The correlation between
26 a traffic rank value and a high quality score was not statistically significant (p=0.54).
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29 The assessment of the 88 blogs using a previously published checklist gave the
30 following results: mean score of 4.6/9 for credibility of the resource, 6.5/7 for the content,
31 and 2.9/3 for the design of the blog. The final mean score was 14 (median: 15, IQR: 12-16).
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51 ¹³ Overall, the comparison of scores obtained with the two scales was significantly different
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($p < 0.01$). Eight of the top 10 blogs listed using the developed tool obtained a score ≥ 16 with the published checklist corresponding to the 3rd quartile of the distribution. (Appendix 4 and 5)

Blogger perceptions

Among the 58 bloggers with available contact information, 29 bloggers accepted to participate to the survey. The sample had a gender ratio representative of the overall study population, and comprised mainly academic researchers (14, 48%). The analysis of *verbatim* responses revealed that bloggers were motivated by teaching, disseminating information, sharing their experience and opinion, and encouraging discussions. The blog gave them a platform for freedom of expression, and bloggers derived satisfaction from sharing information and obtaining feedback. Blogging also motivated them to keep up to date with developments in the field and helped them to build their profile. Through their blog, bloggers expected to give easy access to relevant information which may affect the research or practices of readers. When considering what they felt was unique about their blog, respondents reported that their blog was uniquely broad or specialized, or provided a unique angle due to their background, experience or discipline. The intended audience was, in descending order, clinicians, researchers and public.

Reader perceptions

Among the 106 readers who participated in the survey, 57% were female with a median age of 40.5 (IQR: 33-51) years. Two third were clinicians (62%) and others were mainly researchers (31%). They regularly read a median of 2.7 (IQR, 1-3) blogs to keep up

1 with: the latest research publications for 86 (76.79%); news and developments in the field for
2 49 (62%); or professional current opinion for 56 (58%). Readers liked their favorite blog for
3 the topic or the variety of topics covered, the author's unique viewpoint, or a concise and
4 synthesized format, with regular updates. It represented a source of enjoyment for some of
5 them. Most readers (78%) never or rarely commented on blogs, and 56% often or sometimes
6 shared blog posts with colleagues. Finally, 62% of readers considered the presentation of the
7 blog as important and 52% felt the inclusion of multimedia was important.
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19 **DISCUSSION**

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24 The content of 88 infectious disease blogs showed most blogs focused on
25 microbiology and were intended for research purposes. The results suggest that some
26 improvement may be gained regarding the presentation and attractiveness of blogs.
27 Antimicrobial stewardship appeared to be poorly represented in the blogosphere (7 blogs,
28 mean score 48.6, range 29.8 - 64.4) despite the large public health problem posed by
29 antimicrobial resistance. Overall, messages impacting daily practices were delivered by 34%
30 of blogs analyzed. Blogs appeared as a free medium of expression for bloggers giving them
31 the opportunity for wide-reaching and independent visibility. For readers, these tools were an
32 easy way to get a large amount of cutting-edge information with sometimes expert analysis
33 on emerging and controversial issues.
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51 Social media is now firmly embedded within healthcare.^{4,14,15} In the recent global
52 threats presented by MERS-coV, Ebola, antimicrobial resistance, blogs were used as a
53 medium to instantaneously share data among professionals on the epidemiological situation
54 and control measures.^{16,17} In this way, non-published information, study results, analysis and
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1 opinion were disseminated avoiding the comparatively publication process required by
2 scientific journals. Several blogs selected in the top 10 list in the present study published
3 multiple posts addressing the management of these acute emerging situations.^{16–21} Moreover,
4 as a synergistic tool with peer reviewed journals, blogs can advertise published articles,
5 making them widely read and increasingly cited. They synthesize and facilitate access to
6 research findings in various fields (including for patients and the public), giving a broad
7 vision of health science and possibilities of collaboration on translational projects.
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10 This channel of communication may not present the same level of selection, quality
11 control, or improvement process demanded by peer review journal. Most blogs offer
12 opportunities for comment, response and interactions to refute or endorse the information
13 given in posts, but in practice are rarely used by readers (32% of blogs had at least one post
14 commented). Most high level blogs listed in the present study, were maintained by a
15 multidisciplinary team comprising HCPs and academics, allowing cross-checking of posts
16 quality. During the selection process, 48% (141/295) of blogs did not publish posts during the
17 6 months prior to data collection for this study. This raises the question of reliability of
18 outdated information delivered by some blogs.
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21 The quality assessment tool developed for the present study including quantitative and
22 qualitative criteria, gave a frame to measure the value and accuracy of the message delivered.
23 The published checklist used as a comparison to the quality assessment developed in this
24 paper focused on the credibility, the content and the design of blogs.¹³ This checklist gives
25 an overall estimation of blogs and evaluates them as educational support rather than
26 platforms to share information and ideas.
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29 Regarding the format, pictures and video are becoming more widespread in blogs,
30 complementing the text and helping readers to understand the message. Blogs with high
31 quality scores also tended to invite expert guest bloggers or interviewees. This opportunity
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1 gives credibility to the message delivered and to the blog in general. Globally, the best blogs
2 stand out from the crowd by giving a clear statement regarding their purpose, being easy to
3 read and nicely presented with a high level of analysis.
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7 The field of antimicrobial stewardship and infection control appeared poorly
8 represented in the blogosphere. With knowledge and recommendations on the efficient and
9 accurate use of antibiotics in constant change, the creation of a blog giving clear information
10 and understandable advice to clinicians on antimicrobial stewardship would be an interesting
11 perspective to explore.
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22 Previous studies assessing blogs focused on other healthcare disciplines and
23 highlighted the concern of the medical world about blogs as a medium of communication.
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27 ^{22,23} To our knowledge, the present work is the first to provide such a detailed analysis
28 regarding and assessment of blogs, bloggers and their audience in the topic of ID, IPC, MM
29 and AMS. Our developed assessment scale could be used to assess blogs approaching other
30 fields of health science giving an accurate value of blogs to be estimated. ¹³ The PRISMA
31 method allowed a selection and analysis in the same way as systematic review, reducing
32 subjectivity. The list of blogs identified within this article can help guide interested readers to
33 find the most helpful blog in English for their professional activity. The qualitative view of
34 bloggers and readers is essential to understand how blogs may be used and how they should
35 be structured.
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51 We acknowledge several limitations in this study. Firstly, although we identified, by
52 the snowball sampling, a large proportion of the most influential blogs in infectious diseases,
53 microbiology and infection control, some blogs may have not been captured by this approach.
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58 Secondly, the qualitative criteria were scored by three different people and reflect their own
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1 perception and scoring could be considered subjective. The use of a Likert scale has been
2 shown to reduce this bias.²⁴ Finally, the study only focused on blogs developed for HCPs or
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4 researchers. Blogs aimed at patients and the public will become increasingly important as
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6 healthcare shifts towards a more patient-centered approach.
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10 11 12 **CONCLUSION** 13 14 15

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17 Blogs mainly aggregate relevant articles, publicize and critique important findings,
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19 and highlight implications for frontline staff or researchers. While academic journals remain
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21 the standard for disseminating scientific knowledge, blogs represent user-friendly, interactive,
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23 and efficient tools for the development of online research communities, and are a powerful
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25 way of sharing time-sensitive information, analysis and opinion on emerging issues. Crucial
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27 topics such as antimicrobial stewardship are still poorly represented in the blogosphere.
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38 **Acknowledgements** 39 40

41 *Financial Support:* This research was partially funded by the National Institute for Health
42
43 Research (NIHR) Health Protection Research Unit in Healthcare Associated Infection and
44
45 Antimicrobial Resistance at Imperial College London, in partnership with Public Health
46
47 England (PHE), and the NIHR Imperial Patient Safety Translational Research Centre. The
48
49 views expressed are those of the author(s) and not necessarily those of the National Health
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51 Service (NHS), the NIHR, the Department of Health, or PHE. The authors also acknowledge
52
53 the UK Clinical Research Collaboration Centre for Infection Prevention and Management,
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Imperial College Healthcare NHS Trust, and the NIHR Imperial Biomedical Research
Centre.

Conflict of interest: All authors report no conflicts of interest relevant to this article.

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TABLE 1 — Criteria selected for the quality assessment of the blogs architectures and contents.

Assessment criteria	Quotation	Criteria included in the quality assessment tool
<u>Blog architecture</u>		
1. Age of the blog	In years	-
2. Presence of External link	Yes/No	Yes = 1 point
3. Presence of Blogroll	Yes/No	Yes = 1 point
4. Presence of Archives	Yes/No	Yes = 1 point
5. Presence of video	Yes/No	Yes = 1 point
6. Presence of pictures	Yes/No	Yes = 1 point
7. Presence of audio	Yes/No	Yes = 1 point
8. Possibility to leave comments	Yes/No	Yes = 1 point
9. Link to social media	Yes/No	Yes = 1 point
<u>Blog content</u>		
1. Frequency of posts	Daily, Weekly, Monthly, Quarterly, Yearly	Daily = 5, > 1 year = 1 *
2. Post published recently	The day of review, 1 week before, 1 month before, 1 quarter before, 2 quarters before	The day = 5, > 6 months = 0 *
3. Regularity of posts	Yes/No	Yes = 1 point *
4. Posts by invited experts	Yes/No	Yes = 1 point
5. Presence of advert	Yes/No	No = 1 point
6. Clear statement	Scale from 1 (Poor) to 5 (High)	1 to 5 *
7. Presentation, looking	Scale from 1 (Poor) to 5 (High)	1 to 5 *

1	8. Opinion from authors	Scale from 1 (Poor) to 5 (High)	1 to 5 *
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3	9. Easy to read	Scale from 1 (Poor) to 5 (High)	1 to 5 *
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5	10. Field covered	Broad, Medium, Narrow	-
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10 *Criteria considered of high importance were multiplied by a factor two in the formula

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TABLE 2 — Characteristics of Health Blogs and bloggers: 2015

Characteristics	% (No.)
Blog topics	
General	88
Infectious diseases	28 (32%)
Antimicrobial stewardship	7 (8%)
Microbiology	46 (52%)
Infection control	7 (8%)
Blogs with specific topic	38
Parasitology/mycology/Malaria	11 (13%)
Bacteriology	7 (8%)
Virology	9 (10%)
STI, HIV, HCV	3 (3.5%)
Emerging infectious diseases	3 (3.5%)
Microbiome	3 (3.5%)
Vaccination	2 (2%)
Blog's perspective	
Scientific/research	51 (58%)
Info for practice	30 (34%)
Education	5 (6%)
Historical	2 (2%)
Demographic Characteristics of Bloggers	
Gender	72

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Female	16 (23%)
Male	50 (69%)
Both male and female authors	6 (8%)
Age, y	62
20/30	4 (7%)
30/40	20 (32%)
40/50	16 (25%)
50/60	13 (21%)
60/70	10 (15%)
Education	67
PhD, MD PhD	36 (54%)
MD MPH, MD MSc	3 (4%)
MD	9 (13%)
MPH, MSc, PhD student	10 (15%)
BS, paramedics, pharmacists	6 (10%)
Non-healthcare	3 (4%)
Position	69
Clinician	33 (48%)
Academic	25 (36%)
Other	11 (16%)
Number of bloggers/blog	78
1	57 (73%)
>1	21 (27%)

Abbreviations: STI, sexually transmitted infections; HIV, human immunodeficiency virus;
HCV, hepatitis C virus; MD, medical doctor; PhD, Philosophy doctor; MSc, Master of
sciences; BS, bachelor of science

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TABLE 4 — The top 10 blogs by topic: 2015

Blog Name	URL	Blogger’s Descriptive Quote	Scores 1 a	Score 2 b
Infectious diseases				
PEJM, HIV and ID Observations	http://blogs.jwatch.org/hiv-id-observations/	“dialogue on HIV/AIDS, infectious diseases”	59	16
Global network, neglected tropical diseases	http://endtheneglect.org/	“raise the awareness to control neglected tropical diseases”	58.4	12
TRACKING ZEBRA	http://www.trackingzebra.com/new-blog/	“Infectious disease, politics, healthcare”	57 ^c	15
Microbiology				
Blastocystis parasite blog	http://blastocystis.net/	“role of this parasite in health and diseases”	57.4	16
Virology Down Under	http://virologydownunder.blogspot.com/	“Info and opinion on viruses”	57 ^c	16

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22	Mbiosphere	http://mbioblog.asm.org/mbiosphere/	<i>“The latest news from the journal of the American society of microbiology”</i>	61.4	17
23					
24					
25					
26					
27	Microbe Post	http://microbepost.org/	<i>“a blog from the Microbiology Society”</i>	64	15
28					
29	Moselio Schaechter	http://schaechter.asmblog.org/schaechter/	<i>“appreciation for the width and depth of the microbial activities”</i>	61	16
30					
31					
32					
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34					
35	Virology blog	http://virology.ws/	<i>“About virus and viral diseases”</i>	64	17
36					
37					
38					
39					
40	Infection control				
41					
42					
43	Controversies in Hospital Infection	http://haicontroversies.blogspot.com/	<i>“Wherein we ponder vexing issues in infection prevention and control, inside and outside the hospital. “</i>	61	16
44					
45	Prevention				
46					
47					
48	Reflection on infection prevention and control	http://reflectionsipc.com/	<i>“reflections on IPC based on clinical microbiology, epidemiology, science & literature, and the practical issues”</i>	64.4	18
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53					

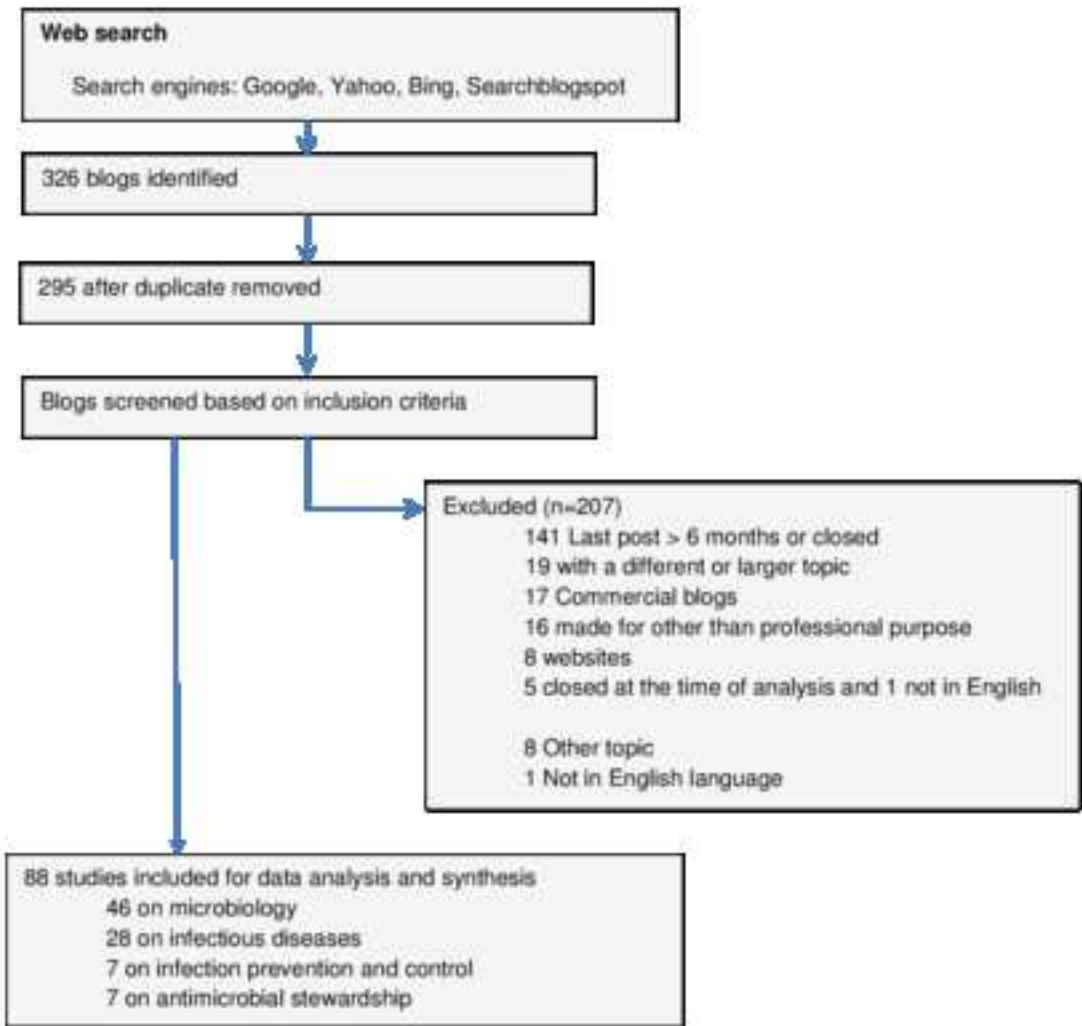
a Score obtained using the developed tool

b Score obtained using the checklist including the 19 criteria (1 point for the presence of the criteria and 0 if absence) published by Lin et al ¹³

c Two blogs obtained the same score and were positioned in tenth position

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FIGURE 1 — Flowchart of the search strategy



Appendix 1: Keywords used for the selection of blogs

emerging infections blog, Infection blog, Infection control blog, Infectious diseases blog, antimicrobial blog, bacteriology blog, clinical microbiology blog, emerging infection blog, human parasite blog, human virus blog, malaria blog, medical microbiology blog, medical mycology blog, microbiology blog, parasite blog, parasitology blog, plasmodium blog, virology blog

Appendix 2: Formula of the aggregated and weighted score

Score = (No advertising, 1 point) + (Possibility to leave comment, 1 point) + (Pictures, 1 point) + (Video, 1 point) + (Audio, 1 point) + (Invited experts, 1 point) + (Link to social media, 1 point) + (Archives, 1 point) + (Blogroll, 1 point) + (External link, 1 point) + 2 * [(Post published recently, 1 to 5 point) + (Frequency of posts, 1 to 5 point) + (Regularity of posts, 1 point) + (Clear statement, 1 to 5 points) + (Presentation, looking, 1 to 5 points) + (Easy to read, 1 to 5 points) + (Opinion from authors, 1 to 5 point)]

Example of scoring:

Assessment criteria	Points assigned	Aggregated and weighted score
<u>URL:</u> http://reflectionsipc.com/		
<u>Blog architecture</u>		
1. Age of the blog	-	
2. Presence of External link	Yes = 1 point	1 point
3. Presence of Blogroll	Yes = 1 point	1 point
4. Presence of Archives	Yes = 1 point	1 point
5. Presence of video	Yes = 1 point	1 point
6. Presence of pictures	Yes = 1 point	1 point
7. Presence of audio	No = 0 point	0 point
8. Possibility to leave comments	Yes = 1 point	1 point
9. Link to social media	Yes = 1 point	1 point
<u>Blog content</u>		
1. Frequency of posts	Weekly = 4	8 points
2. Post published recently	The day = 5	10 points
3. Regularity of posts	Yes = 1 point	2 points
4. Posts by invited experts	Yes = 1 point	1 point

5. Presence of advert	No = 1 point	1 point
6. Clear statement	4	8 points
7. Presentation, looking	4.7	9.4 points
8. Opinion from authors	5	10 points
9. Easy to read	4	8 points
<u>Final score</u>		64.4 points

Appendix 3: Questions used for the surveys addressed to bloggers and readers

Infectious Diseases Blogger Survey

- How many people are following your blog?
- How many views did your blog have last month?
- Who do you think reads your blog?
- What are your motivations for blogging?
- What is the impact of your blog for you?
- What is the impact of your blog for your readers?
- What do you think is unique about your blog?
- What is your current job position?
- What is your age?
- What is your gender?

Infectious Diseases Blog Reader Survey

- Do you want to take part in the study?
- How many infectious diseases blogs do you regularly read?
- What do you use infectious diseases blogs for?
- How often do you comment on the posts that you read?
- How often do you share blog posts that you read?
- How important is the presentation of the blog?
- How important is it to have multimedia in the blog?
- Which is your favourite blog to read, and why?
- What is your current job position?
- What is your gender?
- What is your age?

Appendix 4: Comparison describing overlaps and discrepancies between the developed tool and the validated checklist by Lin et al. Each line is displaying the list of criteria included in the developed tool and corresponding criteria from the validated checklist.

Items	Criteria included in the developed tool	Criteria from the validated checklist by Lin et al.	
Bloggers characteristics			
	1- Blogger age	B5 - Is the identity of the ressource s author clear?	
	2- Blogger education	B5 - Is the identity of the ressource s author clear?	B7 - Is the author well qualified to provide information on the topic?
	Blogger position	B5 - Is the identity of the ressource s author clear?	B7 - Is the author well qualified to provide information on the topic?
Blog architecture & design			
	3- Presence of External link		
	4- Presence of Blogroll		
	5- Presence of Archives		
	6- Presence of video		
	7- Presence of pictures		
	8- Presence of audio		
	9- Possibility to leave comments	B9 - Are there comments from other learners/contributors that endorsed or refute the information presented in the resource?	
	10- Link to social media		
		B17 - Is the information presented in the resource of a consistent quality?	
	B18 - Is the resource stable (link work, no crash...)		
	B19 - Is the resource useful and relevant for its intended audience?		
Blog content			
	11- Frequency of posts		
	12- Post published recently		
	13- Posts by invited experts		
	14- Presence of advert	B1 - Is the editorial process independant from sponsors, conflict of interest and other type of bias?	B4 - Does the ressources clearly differentiate between advertissment and content?
	15- Clear statement	B12 - Are the resource statement consistents consistent with it references?	B15 - Is the topic of the resource well defined and labeled appropriately?
	16- Presentation, looking		B14 - Is the content of the resource presented in a logical, clear and coherent way?
	17- Opinion from authors	B11 - Does the resource make a clear difference between facts and opinion?	
	18- Easy to read	B13 - Does the resource use correct grammar and spelling?	B14 - Is the content of the resource presented in a logical, clear and coherent way?
		B10 - Is the information presented in the resource accurate?	
		B11 - Does the resource make a clear difference between facts and opinion?	
		B16 - Does the content meet generally accepted standards for journalistic professionalism?	
Credibility			
		B2 - Do the creators list their conflict of interests?	
		B3 - Are the creators free of any financial conflict of interest?	
		B6 - Is the resource transparent about who was involved in its creation and does it list all entities that contributed?	
		B7 - Is the author well qualified to provide information on the topic?	
		B8 - Does the resource cite its references?	
		B9 - Are there comments from other learners/contributors that endorsed or refute the information presented in the resource?	

Appendix 5: Scores obtained using the validated checklist by Lin et al.

N=87, one link for a blog was broken during the analysis	N° (%) of blogs scored with “Yes”	N° (%) of blogs scored with “No”	N° (%) of blogs scored with “Unknown”	Other	Means of blogs scored with “Yes” score by dimension
Credibility: is the resource credible?					4.64 /9
<i>Bias and conflict of interest</i>					<i>1.34/4</i>
B1 - Is the editorial process independent from sponsors, conflict of interest and other type of bias?	16 (18.2)	4 (4.5)	67 (76.1)	1	
B2 - Do the creators list their conflict of interests?	9 (10.3)	78 (89.7)	0	0	
B3 - Are the creators free of any financial conflict of interest?	15 (17.2)	6 (6.9)	66 (75.9)	0	
B4 - Does the resources clearly differentiate between advertisement and content?	83 (95.4)	3 (3.4)	1 (1.1)	0	
<i>Authors</i>					<i>2.01/3</i>
B5 - Is the identity of the resource s author clear?	64 (73.6)	23 (26.4)			
B6 - Is the resource transparent about who was involved in its creation and does it list all entities that contributed?	60 (68.9)	27 (31)			

B7 - Is the author well qualified to provide information on the topic?	51 (58.6)	32 (36.8)	4 (4.6)		
<i>Scholarship</i>					1.21 /2
B8 - Does the resource cite its references?	78 (89.7)	9 (10.3)			
B9 - Are there comments from other learners/contributors that endorsed or refute the information presented in the resource?	28 (32.2)	59 (67.8)			
Content: is the content of this educational resource of good quality?					7/7
<i>Accuracy</i>					3.8/4
B10 - Is the information presented in the resource accurate?	85 (97.7)	2 (2.3)			
B11 - Does the resource make a clear difference between facts and opinion?	78 (89.7)	9 (10.3)			
B12 - Are the resource statement consistent with it references?	83 (95.4)	2 (2.3)	2 (2.30)		
B13 - Does the resource use correct grammar and spelling?	85 (97.7)	2 (2.3)			
<i>Didactic approach</i>					2.73/3
B14 - Is the content of the resource presented in a logical, clear and coherent way?	78 (89.7)	9 (10.3)			
B15 - Is the topic of the resource well defined and labeled appropriately?	83 (95.4)	4 (4.6)			
B16 - Does the content meet generally accepted standards for journalistic professionalism?	77 (88.5)	10 (11.5)			
Design: is the resource well design?					2.88/3
<i>Accessibility and layout</i>					2/2
B17 - Is the information presented in the resource of a consistent quality?	82 (94.2)	5 (5.7)			

B18 - Is the resource stable (link work, no crash...)	85 (97.7)	2 (2.3)			
<i>Didactic value</i>					<i>1/1</i>
B19 - Is the resource useful and relevant for its intended audience?	84(96.5)	3 (3.4)			
TOTAL					14.06