

Antimicrobial resistance (AMR) inquiry

Submission from the Homeopathy Research Institute (HRI)

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1. Executive Summary

- 1.1 The UK Five Year Antimicrobial Resistance Strategy 2013 to 2018 states that development of novel therapies is an important element of the multi-faceted approach to tackling AMR¹. The Homeopathy Research Institute (HRI) suggests that homeopathy, currently not included within this Strategy, offers a novel approach to the treatment of infection and could therefore play an important role in the fight against AMR.
- 1.2 HRI has identified two specific ways in which homeopathy could be used to reduce the use of existing antibiotics: 1) as an additional first line treatment for acute otitis media in children (AOM), and 2) as an alternative to the large-scale routine use of antibiotics to reduce the incidence of bacterial infections in farm animals (metaphylaxis).
- 1.3 HRI recommends that the Department of Health conducts research to determine definitively whether homeopathy is efficacious for AOM (we suggest a multi-centred randomised placebo-controlled comparative trial).
- 1.4 HRI recommends that Defra conducts research to determine definitively whether the homeopathic medicine *Coli 30K* is efficacious for reducing the incidence of *E.coli* bacteria in neonatal piglets (we suggest a multi-centred observer blinded, randomised placebo-controlled trial).
- 1.5 The type of homeopathic prescribing needed to treat AOM in children is relatively simple. Should the trial confirm efficacy, HRI has the expertise to create a short training module enabling GPs, as well as homeopaths, to treat this condition effectively.
- 1.6 The use of *Coli 30K* for *E.coli* diarrhoea in livestock would be straight forward to introduce in farming practice; no homeopathic training would be needed – just clear guidelines on handling and delivering the medicine correctly.
- 1.7 Recommendations 1.3 and 1.4 are in line with the AMR Strategy's strategic aims i.e. to 'conserve and steward the effectiveness of existing treatments' and 'to stimulate the development of ...novel therapies'¹.
- 1.8 Homeopathy is a controversial subject and, as such, we expect any recommendation involving homeopathy to be met with scepticism by certain parties. However, it is important to note that homeopathy research is a rapidly evolving field and the two most important studies discussed in this submission, published in 2010 and 2012^{2,3}, have not been presented previously to any Select Committees.
- 1.9 The threat to global health from AMR is too grave for us not to explore all potential measures. Compared with other avenues of enquiry being discussed in the 2013-2018 Strategy (such as the development of new antibiotics), it would be relatively easy and inexpensive to establish scientifically whether HRI's suggestion that homeopathy could be used to reduce antibiotic use, both in humans and in animals entering the food chain, would work.
- 1.10 HRI would welcome the opportunity to assist the Department of Health and Defra in investigating the potential for homeopathy to play a role in tackling AMR.

2. About the Homeopathy Research Institute

- 2.1 The Homeopathy Research Institute (HRI) is a UK based charity dedicated to promoting high quality research in homeopathy and accurate dissemination of existing research findings in the field (www.homeoinst.org). We use our resources and expertise to foster new projects and to improve the quality of research being carried out in the field.
- 2.2 Homeopathy is a form of holistic medicine used to treat both acute and chronic conditions. Homeopathy is growing in popularity; it is used by 6 million people in the UK⁴, 100 million people in the European Union⁵, and in India alone, 100 million people depend solely on homeopathy for their medical care⁶. A form of medicine used as widely as this needs scientific evaluation, yet scientific research in homeopathy is a relatively new and unexplored field. As a consequence, there are many important, unanswered questions, particularly concerning which conditions it can treat and exactly how homeopathic medicines work. HRI is dedicated to addressing this need for high quality research in the field.

3. Limitations of the UK Governments 2013-2018 approach to AMR

- 3.1 Since the first 'UK AMR Strategy in 2000'⁷ multiple actions have been taken to improve prescribing practice and conduct AMR research¹, but despite these measures AMR has continued to escalate¹. This highlights the need to explore fresh solutions; identifying possible new treatments for common infections and assessing their potential through rigorous research, should therefore be a priority.
- 3.2 The Government's 2013-2018 strategy would be strengthened by investigating the potential of homeopathy as an additional treatment option for certain key infections which currently require routine use of antibiotics.

4. Homeopathy in the context of AMR

- 4.1 In the present submission we present evidence supporting HRI's recommendation that the following strategies for reducing antibiotic prescribing are fully explored:
 - a. Introduction of individualised homeopathic care as a treatment option for children with acute otitis media (AOM).
 - b. Use of a non-individualised homeopathic medicine instead of antibiotics for reducing *E.coli* diarrhoea in neonatal piglets in farming.
- 4.2 HRI has chosen these two specific areas because:
 - a. Concern has been raised about the excessive use of antibiotics in both otitis media⁸ and farming animals,¹ as current approaches are believed to contribute to the rapid development of bacterial resistance in antibiotics – the form of AMR which is 'of greatest concern'¹.
 - b. There is sufficient published scientific evidence suggesting that homeopathy may be effective and/or efficacious in these conditions to warrant further research.
 - c. The types of homeopathic prescribing needed for AOM and *E.coli* diarrhoea prevention in animals is simple; this means that if further research did confirm efficacy of homeopathy in these situations, it would be easy to implement these interventions either alongside, or in place of, existing approaches, as appropriate.

5. Reducing the use of antibiotics for AOM in children

5.1 Acute Otitis Media and AMR

5.1.1 The CMO report identifies otitis media as ‘among the commonest causes of children being brought to medical attention’⁸. The prevalence of this condition, combined with the specific challenges in differentiating between viral and bacterial forms of the disease, make it a priority in terms of improving treatment strategies and reducing antibiotic prescribing.

5.2 Homeopathy to treat AOM

5.2.1 At the moment there are only two choices in managing AOM: either immediate antibiotic treatment in case it is the uncommon bacterial form of the condition, or delaying antibiotic therapy for 2-3 days on the basis that it is more likely to be a viral infection (known as ‘watchful waiting’). The former approach can lead to widespread inappropriate use of antibiotics, whilst the latter may increase the risk of complications from delayed treatment of a bacterial infection⁸.

5.2.2 Homeopathy offers an additional choice. In cases where watchful waiting would currently be recommended, homeopathy could be given immediately instead. Any patients who did not respond to homeopathic treatment by day 3 would be given antibiotics (just as they would with watchful waiting).

5.2.3 As there are virtually no side effects from homeopathic medicines⁹ and they do not contribute to antimicrobial resistance, there is no expected negative impact from this proposed additional intervention. However, if homeopathy proved to be an effective treatment by day 3 of the disease, the potential benefits would include the reduced use of antibiotics and delivery of prompt treatment.

5.2.4 HRI recommends that a trial be designed to test the efficacy or effectiveness of incorporating homeopathy in this way, as part of an integrated approach to managing children presenting with signs of AOM.

5.2.5 AOM is well-suited to homeopathy research for the following reasons:

- a) In the vast majority of cases AOM is a simple, self-limiting complaint (78% of cases resolve without treatment after a few days)¹⁰.
- b) Homeopaths in the UK, working either within the NHS or in private practice, are already routinely treating AOM and report success in treating the condition.

5.3 Scientific evidence assessing homeopathy for AOM

5.3.1 A 2006 Health Technology Assessment report on effectiveness, cost-effectiveness and appropriateness of homeopathy commissioned by the Swiss Federal Office for Public Health identified 29 studies on the effectiveness of homeopathy for Upper Respiratory Tract Infections (URTIs), of which 26 were positive¹¹. Within the URTI studies, six related specifically to AOM (a short tabulated summary of these studies is available on request).

5.3.2 These positive studies, whilst varying in design and quality, collectively suggest that homeopathy may be effective for AOM and that the approach warrants further investigation. For example, a team of paediatricians at Washington University performed a double-blind RCT pilot study in 2001 comparing homeopathic treatment with placebo¹². Fewer treatment failures (i.e. requiring standard

treatment) were seen in the homeopathy group, but due to the small sample size (N=75), the result was not statistically significant.

- 5.3.3 Since the 2006 Swiss HTA, two further relevant studies have been published. In 2011, the same team at the University of Washington performed a pragmatic randomized controlled trial comparing standard care with standard care plus homeopathic ear drops in children with AOM¹³. This study, which involved 119 children, concluded that homeopathic ear drops were moderately effective ($p=0.04$) in treating otalgia in children with AOM and may be most effective in the early period after diagnosis.
- 5.3.4 A pragmatic randomised controlled trial carried out by a team in Jaipur, India compared individualised homeopathy with conventional care for children with AOM³. Patients who did not improve were prescribed antibiotics at the 3rd day. 81 patients were included. In the conventional group all 40 patients (100%) were cured; in the homeopathy group 38 patients (95%) were cured, while 2 patients (5%) were lost to the last two follow-ups. In the conventional group all but one patient (97.5%) showed no significant improvement over the first 3 days of treatment (antipyretics and anti-inflammatory medication) and were prescribed antibiotics. In the homeopathy group no antibiotics were required. Even though treatment was individualised, 85% of patients responded to one of only six homeopathic medicines.
- 5.3.5 A strength of this study is that patient examination was performed by an ENT specialist – blinded to group allocation – using a standard outcome measure (AOM-SOS scale) and tympanic examination.
- 5.3.6 As this trial was designed to assess the relative clinical effectiveness of conventional care and homeopathy, and not to determine the efficacy of homeopathic medicines, it did not include a placebo group. However as the efficacy of homeopathic medicines is still under question, a placebo control arm could be added to the trial design to address this additional question.
- 5.3.7 As there were no significant differences between groups in the main outcome measures, the authors concluded that individualised homeopathy is as effective as conventional treatment in AOM. Symptomatic improvement was quicker in the homeopathy group, and most importantly for this AMR inquiry, the homeopathy group required no antibiotics. As the treatment delivered in this study so closely reflects real world clinical care, it has strong external validity and is particularly relevant to this inquiry.
- 5.3.8 Overall, the results of these eight studies suggest that homeopathic treatment (comprising a consultation and a homeopathic medicine) may be effective in treating AOM thereby reducing the use of antibiotics for this condition. As such this line of enquiry should be pursued.

5.4 Proposed further research of homeopathy for the treatment of AOM

- 5.4.1 HRI recommends that a randomised placebo-controlled trial be performed to assess the efficacy of homeopathy for AOM in the UK. We consider the most appropriate design to be a three armed trial: usual care (watchful waiting); individualised homeopathic treatment (homeopathic consultation plus homeopathic medicine); placebo control (homeopathic consultation plus placebo). Patients in all groups who fail to improve by 50% after 72 hours would be given antibiotic treatment.
- 5.4.2 HRI's recommendations reflect our opinion based on previous experience with homeopathy and homeopathy research, however the most appropriate trial design would depend on which specific question(s) the DH wishes to see answered; we therefore welcome discussion with the DH on this issue.

5.5 Practicalities of introducing homeopathy as an additional first line treatment for AOM in the NHS

5.5.1 The Department of Health may perceive it as a significant challenge to introduce homeopathy as a primary measure in the treatment of AOM due to the individualised prescribing and specialist homeopathic training needed. However, HRI believes that this could be achieved in a relatively simple manner. If the trial confirms what clinicians experience in practice i.e. that the majority of AOM cases respond well to a small number of homeopathic medicines, HRI has the necessary team of experts in homeopathy to use this data to create a 'simplified prescribing scheme'; HRI would be able to create a short training module enabling GPs, as well as homeopaths, to treat the majority of AOM cases. This would mean that only rarer cases which fall outside this prescribing scheme, or more complex cases of recurrence or chronicity, would need referral to fully trained homeopathic practitioners.

6. Reducing the routine use of antibiotics in animal farming

6.1 Antibiotics in the farming industry

6.1.1 It is estimated that more than half of the worldwide production of antibiotics is used by the farming industry¹⁴, being given for three different reasons:

a. **Therapeutic use i.e. treatment of disease**

Animals are routinely put on a course of antibiotics to treat common bacterial infections. This is usually a high dose given over a relatively short term. It is now common practice to treat the whole herd prophylactically (metaphylaxis) to stop the infection spreading.

b. **Disease prevention or chemoprophylaxis**

Low, sub-therapeutic doses of antibiotics may be given to animals en mass over periods of weeks when they are considered to be at risk of infection.

c. **Growth promotion**

The practice of using low doses of antibiotics to promote growth in animals, common in the US and worldwide, is now banned in the EU. However in practice, growth-promoting effects are achieved through the low doses administered as chemoprophylaxis, thereby blurring the boundaries between the two uses.

6.1.2 Previous reports by DEFRA^{15,16} have presented data which,

a. Indicated that higher use of antibiotics in farming correlates with higher levels of bacterial resistance.

b. Confirmed that antibiotic resistance spreads between members of the same species.

c. Showed that reducing the use of antibiotics decreases the levels of bacterial resistance at farm and country level, as demonstrated by comparing conventional farming with organic farming.

6.1.3 Homeopathy has traditionally been used for the treatment of animals as well as humans. In the UK, 140 homeopathic veterinarians, treating both pets and farm livestock, routinely use homeopathy to treat a wide variety of health conditions¹⁷.

6.1.4 *E.coli* diarrhoea prevention has been identified as a clinically relevant issue for which homeopathy could be efficacious and some research has been conducted to begin evaluating this approach.

6.1.5 If left untreated, neonatal diarrhoea in piglets leads to weight loss and, not uncommonly, to death of the piglet, resulting in significant financial losses to the farmer. Three studies have been carried out exploring the use of a homeopathic medicine instead of antibiotics for metaphylaxis in piglets^{2,18,19}. Two have looked specifically at the prevention of *E. Coli* diarrhoea^{2,19}. In 2009 a Brazilian group compared standard antibiotic treatment with homeopathy and biotherapy, and showed a marked benefit from the use of homeopathy (N= 46, p=0.02)¹⁹. A more recent and robust trial was carried out by researchers at the University of Wageningen in the Netherlands². This observer blind, randomised placebo-controlled trial used a homeopathic medicine derived from *E. Coli* bacteria (*Coli* 30K). 52 sows were randomly allocated into either the homeopathy group or the placebo group. The sows gave birth to 525 piglets which were scored for occurrence and duration of diarrhoea. The results clearly showed an effect of the homeopathic medicine with only 3.8% of the homeopathy group suffering from diarrhoea compared to 23.8% in the control group (p<0.0001).

6.2 Suggested further research strategy

6.2.1 The potential benefits of the use of homeopathy in the treatment of neonatal diarrhoea in piglets is considerable, furthermore it does not carry the risk of AMR. Following the statistically significant positive result of the high quality trial conducted in the Netherlands, HRI recommends that Defra conducts a replication of this study. A large-scale multi-centred approach would allow firm conclusions to be reached as to whether this form of homeopathic treatment is efficacious for prevention of *E.coli* diarrhoea in piglets in the UK and could therefore replace the use of antibiotics for this purpose.

7. Putting these recommendations in context

7.1 Homeopathy is a controversial subject. However, the statement that homeopathy has been shown to have no effect beyond placebo^{20,21} is based almost entirely on a single comprehensive meta-analysis by Shang et al. published in 2005²². The reliability of this study is therefore of paramount importance. As well as attracting widespread criticism for failing a sensitivity analysis²³, this study is also now becoming out of date. The Shang study based its findings on RCTs published up until 2004, reporting on 110 trials; since then a further 41 trials have been identified which would have met the authors' inclusion criteria. This means that the paper's conclusions are based on only 73% of the relevant RCT literature now currently available. Neither of the two most important studies discussed in this submission^{2,3} were included in Shang et al. 2005.

8. Concluding remarks and suggestions

8.1 The severity of the threat posed by AMR to global health means that all potential measures, particularly novel solutions, must be explored as a matter of urgency.

8.2 HRI therefore recommends that research is carried out to determine whether homeopathy is efficacious for acute otitis media in children and preventing *E.coli* diarrhoea in piglets. Compared with other avenues of enquiry included in the 2013-2018 Strategy (e.g. identification and

development of new antibiotics), such trials would be relatively easy and inexpensive to carry out, yet in return for this small investment, the potential rewards could be vast.

- 8.3 This homeopathic approach could reduce use of our existing antibiotics both in humans and in animals entering the food chain – a powerful two-pronged approach which would protect the effectiveness of our existing antibiotics and allow them to be reserved for more serious clinical conditions.
- 8.4 Homeopathy is a perfect example of the ‘novel treatments and methods’ the UK 2013-2018 Strategy says it aims to investigate as one part of the steps being taken against AMR. HRI would welcome the opportunity to assist the Department of Health and Defra in this vital endeavour.

Declaration of Interests

Ms Rachel Roberts is Chief Executive of the Homeopathy Research Institute. She was in private practice as a registered homeopath (RSHom) and lectured in homeopathy from 1997 - 2012. Rachel is also author of educational flashcards for homeopath students and practitioners.

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