



## Darwin Initiative, Darwin Plus and Illegal Wildlife Trade Challenge Fund Covid-19 Rapid Response Round - Final Report

*Due within two months of the end date of the Rapid Response Round project  
(maximum 6 pages)*

Project reference	CV19RR07
If linked with an ongoing project, please include that project reference here (e.g. IWT001)	N/A
Project title	Understanding post-COVID-19 illegal wildlife-based medicine consumption to inform effective interventions
Country/ies	China
Lead organisation	University of Oxford
Partner institution(s)	Sun Yat-sen University
Start/end date of project	1/1/2021-31/3/21
Which fund was this project relevant to?	Illegal Wildlife Trade Challenge Fund
Grant value (£)	30,859
Project Leader name	Amy Hinsley
Report author(s) and date	Amy Hinsley, Sifan Hu, Kaiwen Zhou, Zhijian Liang, Tien Ming Lee, Diogo Verissimo. 27 <sup>th</sup> May 2021

### 1. Project Summary

The project focussed on examining any changes in the consumption of animal-based medicines during COVID-19, using these data to inform the design of up-to-date interventions to reduce consumption of illegal, wild animal-based medicines.

Understanding consumer behaviour is an important first step to designing effective evidence-based interventions to reduce the illegal wildlife trade (IWT). Highly publicised links between the virus behind COVID-19 and the consumption of certain high-risk wild animals brought wildlife trade and its links to health to the attention of people worldwide. The effects that this has had on wildlife consumer behaviour are difficult to predict, especially for animal-based medicine products. For example, while consumption of wild animals for meat was widely linked to zoonotic disease risk, there was less focus on the risks of consumption of wild animal products as medicines. This is reflected in the fact that farming and consuming high-risk wild animals (e.g. civets) for meat was banned in China shortly after the start of the pandemic, but the use of wild animals for traditional Chinese medicine (TCM) products was exempt from these new laws. Nevertheless, it is possible some consumers may now prefer to use plant-based or synthetic medicines to avoid products made from species where the possible risks from zoonotic disease have been highly publicised following the pandemic (e.g. pangolins). However, consumers' desire to avoid potential risks from animal-based products may also have been outweighed by beliefs that some products could be beneficial to their health, either a preventative or a treatment for COVID-19 symptoms.

Reducing post-COVID-19 IWT linked to medicinal use is a priority, as the trade in threatened species for medicines can have a clear impact on biodiversity. While the project took a broad view of wildlife-based medicines, there was a specific focus on bear bile, due to baseline pre-COVID-19 data collected by this project team on bear bile consumption in China in 2018-2019. In China, bear bile is sourced legally from farmed Asiatic black bears for the TCM industry but can also be sourced illegally from hunted wild bears and sold on the informal market. Little is known about how consumers perceive zoonotic disease risks around bear bile, but it was named as an ingredient in one product included in an official government list of recommended TCM COVID-19 treatments. Some NGOs suggested that this would lead to increased demand and illegal trade<sup>1</sup>, which would lead to depletion of wild bear populations. This would be a potentially serious conservation threat, as hunting for the illegal trade is known to be widespread in Laos, Vietnam and Cambodia<sup>2,3</sup>, representing a leading threat to Asiatic black bears and sun bears<sup>4</sup>. Past studies by this project team found that some consumers may be particularly motivated to seek out illegal products when facing severe illness<sup>5</sup>.

There are many wildlife-based medicines that are traded illegally in countries around the world, but our knowledge of how consumer behaviour changes following an extreme public health threat event such as COVID-19 is poor. This means that current approaches to reducing illegal consumption of bear bile and other products may no longer be as effective, and an updated evidence-base is needed to design effective future interventions. The project addressed this by collecting public survey, consumer preference and medical practitioner knowledge and attitude data in China in early 2021, comparing it to pre-COVID-19 baseline data from 2018 to draw conclusions on any potential changes in consumption. The surveys also asked questions more broadly about risk perceptions and attitudes to bear bile and other wildlife-based medicine consumption. These data and findings were combined with expert knowledge in co-design workshops, where doctors, pharmacy workers, and consumers designed interventions to reduce illegal wildlife-based medicine use in a post-COVID-19 world.

All project activities took place in China, with data collection from the public and pharmacy workers carried out in Guangzhou (Guangdong province) and Nanning (Guangxi province), consumer preference data collected from consumers nationwide, and co-design workshops carried out in Guangzhou (Fig. 1). Project staff travelled to Beijing to present the results of the project to the National Forestry and Grassland Administration (NFGA), the China Association for Traditional Chinese Medicine, and key experts on bear and large mammal conservation.

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<sup>1</sup> <https://eia-international.org/news/unbelievable-chinese-govt-recommends-injections-containing-bear-bile-to-treat-coronavirus/>

<sup>2</sup> Crudge et al., 2020. The challenges and conservation implications of bear bile farming in Viet Nam. *Oryx*, 54(2), pp.252-259.

<sup>3</sup> Davis, E.O., 2020. *Understanding use of bear products in Southeast Asia: Human-oriented perspectives from Cambodia and Laos* (Doctoral dissertation, University of Bristol).

<sup>4</sup> Garshelis, D. & Steinmetz, R. 2020. *Ursus thibetanus* The IUCN Red List of Threatened Species 2020: e.T22824A166528664. <https://dx.doi.org/10.2305/IUCN.UK.2020-3.RLTS.T22824A166528664.en>. Downloaded on 28 May 2021.

<sup>5</sup> Hinsley et al. *in review*. Understanding why consumers 'switch' between wild, farmed and synthetic products in wildlife markets  
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**Figure 1.** Map of key Chinese provinces where project activities took place.

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19 consumption of illegal bear bile and other wildlife-based medicinal products was better understood, and decision-makers and conservation practitioners have the evidence needed to design effective interventions to reduce consumption.

To achieve this outcome, the project focussed on three key phases of activities:

1. *Replicating pre-COVID-19 data collection on bear bile with additional questions on other wildlife-based medicines, to understand if, how, and why consumption has changed*
  - As planned, public surveys and pharmacy-worker interviews were carried out in person in Guangzhou, pharmacy-worker interviews were carried out in person in Nanning, and online consumer experiments were carried out with real bear bile consumers. All data collection in these cases used the same sampling approach and methodology as pre-COVID-19 baseline surveys conducted by the project team in 2018-2019.
  - Unplanned activities also took place. A COVID-19 outbreak in Nanning meant that we could not complete the planned street surveys there. Unlike the Nanning pharmacy interviews, which were more flexible, the large survey teams required to do the street surveys were unable to travel to Nanning before the Lunar New Year holiday. We therefore shifted to our contingency plan of online surveys in Nanning. To improve comparability to the street surveys, we carefully sampled online respondents from the same districts within the city that were previously surveyed. In addition, we added a new activity, replicating the completed Guangzhou street surveys online to compare between online and offline surveys in the same city. In addition, our pharmacy surveys in Nanning were faster than anticipated, so to use the extra half day we had in the city we collected some initial pilot data from pharmacy workers to design a future survey to take a more quantitative approach to understanding medical practitioner behaviour. This will feed into a choice experiment to better understand who is prescribed and sold bear bile and why.
  - We analysed the data, focussing on a) comparisons to the pre-COVID-19 baseline surveys and b) risk perceptions, knowledge, and consumption of animal-based medicines in relation to COVID-19. In summary, we found that:
    - i. The consumption of bear bile products does not appear to have changed significantly during COVID-19. Consumer preferences have changed very little, with large groups of consumers still likely to switch between farmed and wild products (and vice versa) when seriously ill. The greatest change has been more awareness of illegality of wild products amongst those who choose not to use bile.
    - ii. Perceived risk from wild animal-based medicine is significantly lower than wild meat. Bears and other medicinal species such as tigers are seen as low risk compared to taxa such as bats and civets, with the exception being pangolin, which is used medicinally and seen as high risk.
    - iii. Contrary to some NGOs' suggestion that there might be a surge in demand for illegal bear bile, there is very low awareness amongst both the public and medical

## 2. Project Achievements

The project's intended outcome was to ensure that post-COVID-

- practitioners that bear bile was part of a recommended COVID-19 treatment. Practitioners named only plant medicines for COVID-19 prevention.
- iv. Of most relevance to the co-design workshops were consumers' lack of concern and awareness the source of medicine (wild v farmed), the difficulty consumers have identifying legality of animal medicine, and the increased trust in TCM, doctors and messages from official sources after COVID-19 in China.
2. *To use these data to inform co-design workshops where consumers and medical practitioners lead on the design of interventions to reduce illegal consumption*
    - As planned, co-design workshops were held with key stakeholders involved in consumption of bear bile and animal-based TCM: one with animal-based medicine consumers, one with pharmacy workers and one with TCM doctors. Each workshop began with discussion of project findings and participant's experiences of wildlife-based medicine consumption before and after COVID-19. Participants were then asked to reflect on a range of existing intervention designs that aimed to reduce consumption of illegal wildlife products.
    - Participants designed a total of five prototype interventions, based on their knowledge and experience, our findings on consumption, and on their evaluation of existing intervention designs. Participants preferred to discuss interventions in detail rather than follow theory of change structures, so to maximise workshop time, project staff members walked them through each key step of intervention design, before using their discussions to construct the theory of change for each intervention after the workshop.
  3. *Communicating the findings of the project to decision-makers in China*
    - As planned, the SYSU team organised a meeting in Beijing, where they presented the project findings and co-designed interventions to our contacts at the National Forestry and Grassland Administration, China Association of TCM, and key experts working on bear bile trade and other large mammal conservation.
    - As planned, a policy brief was produced in Chinese and disseminated via meeting attendees to their wider organisations. We originally intended to translate and adapt the policy brief and send out to NGOs and other key decision-makers outside of China. We did not complete this work during the project period but the translated document is being prepared for dissemination, including publication on the Oxford Martin Programme on the Wildlife Trade's website.

### *Partnerships*

The project was carried out in partnership between the University of Oxford and Sun Yat-sen University. The team had previously worked together on the pre-COVID-19 data collection project that this work was replicating, so had developed an effective working relationship. The project would not have been possible without this strong partnership.

### *Value for money*

The project represented good value for money as the project team had already worked on a pre-COVID-19 version of the data collection phase in 2018, meaning that the activities in this phase were efficient, and built upon lessons learned to reduce unnecessary costs. We obtained multiple quotes for the organisation and recruitment of the co-design workshops, and opted to use a local Guangzhou research firm rather than an international market research company, which reduced costs considerably. We also recruited research assistants who were trained facilitators and translators, so we used their services instead of a large company. Most staff time in the UK and for senior staff in China was covered by existing funding, meaning that most funds were used to pay early-career research assistants to lead the project in China.

### *Ethics and safeguarding*

All work was carried out following assessment and approval by the University of Oxford Central University Research Ethics Committee (reference: R73067/RE002). The key ethical considerations were the protection of research and co-design workshop participants, and

research assistants working on the project. For research and workshop participants, the main concern was around any questions that could lead to disclosure of personal medical diagnoses or involvement in illegal behaviour. We did not ask directly about personal illegal behaviour, ensured anonymity in the surveys and interviews, and ensured that all data were stored securely. To protect both research assistants and participants from the risk of COVID-19 infection, we budgeted for masks and hand sanitiser for use during surveys and workshops, and cleaning wipes for any shared equipment (e.g. tablets used during surveys). Social distancing was required during workshops. As COVID-19 restrictions vary over time and in different locations in China, local rules were always followed.

### *Gender equality*

Gender equality was considered throughout. Of the four named staff members on the proposal, two are female, including the project lead (AH), and the lead project manager in China (SH), an early career researcher who managed all aspects of project implementation. Field survey teams were predominantly female (see Annex 1, Fig 1), as were research assistants working on online surveys and preparation for the workshops. We collected information on gender during the surveys and interviews, to allow analysis of gender disaggregated data on consumption, but we also provided answer options that recognise that some people may not identify with a binary gender option. We specifically requested a gender-balanced sample of consumers and medical practitioners for the co-design workshops, and managed the discussions carefully to ensure that all contributions were heard. The final meeting with decision-makers was gender-balanced, both in terms of the project team presenting the results and the attendees.

### *Project achievements*

The project successfully achieved what it set out to do, and has provided a strong basis for further work in this area. Our achievements are as follows:

<b>Original objective</b>	<b>Achieved</b>	<b>Reason for difference</b>
Carry out surveys with at least 2000 members of the public in two Chinese provinces	We completed a total of 3243 surveys across two provinces: 1095 street surveys in Guangzhou, 1097 online surveys with respondents in Guangzhou, and 1051 online surveys with respondents in Nanning (see Annex 1, Fig. 1, 2, 3)	A COVID-19 outbreak in Nanning meant that we had to switch to our contingency plan of online surveys in that city. As online surveys can give higher estimates of sensitive behaviours, we repeated the Guangzhou surveys online to provide some comparability.
Carry out key-informant interviews with at least 50 medical practitioners	We completed 51 interviews (See Annex1, Fig 4)	The team travelled to Nanning after the COVID-19 outbreak to complete all interviews as planned.
Carry out targeted consumer surveys online with at least 1000 respondents	We completed 1469 surveys (see Annex 1, Fig. 5)	Due to our prior work with the survey company, the survey was less expensive than anticipated, so we decided to increase our sample to match our pre-COVID-19 sample size of 1421 more closely.
Conduct at least two co-design workshops with consumer and practitioner groups	We completed three co-design workshops: one for consumers, one for pharmacy workers, and one for TCM doctors (see Annex 2)	Rather than a combined workshop for all practitioners, we were advised to have separate workshops for pharmacy workers and doctors, as professional doctors were reported to work better in smaller groups.
Develop two prototype evidence-based	We produced five intervention designs, with an overarching theory	We produced more designs than planned as we held one additional

intervention designs with clear theory of change for each	of change combining all interventions (see Annex 2)	workshop. Furthermore, participants were able to engage with the task better than anticipated, meaning that they identified multiple gaps in current strategies and wanted to develop interventions to address each of them.
Communicate our findings to policy makers and practitioners in China and elsewhere (measure of success: meeting to present and discuss findings with Chinese NFGA; policy brief and journal articles produced)	<p>We held one meeting in Beijing with representatives of NFGA (n=2), the China TCM Association (n=1), Chinese Academy of Forestry (n=2), Beijing Forestry University (n=1), Northeast Forestry University (n=1). (See Annex 3)</p> <p>We produced a policy brief in Chinese that was provided to meeting participants for dissemination within their organisation (see Annex 3), and is now being sent out to other decision-makers (e.g. NGOs, TCM bodies). Journal articles are being prepared, and an English translation of the policy brief is being produced for wider dissemination.</p>	Journal articles are still in preparation, but we intend to write at least 3 open access papers from this work, focused on the results of the pre- and post-COVID-19 survey comparisons and the co-design process and intervention designs.

Our project contributes to the wider aims of the IWT challenge fund by providing evidence-based strategies to reduce demand for IWT products, and ensure that trade in wildlife-based medicines remains sustainable. With COVID-19 changing the way people perceive and consume some wildlife products, it is important to base IWT-reduction strategies in strong evidence. Both the data collected and the co-designed interventions have been discussed with government and industry representatives who can use them to strengthen current approaches to reducing IWT, and develop new ones that are most appropriate to the current situation.

### 3. Lessons learnt

The project highlighted several key lessons and challenges that could be relevant to other programmes. The lessons learnt were:

- It is not always necessary for UK-based researchers to fly to project countries to oversee all aspects of project work, especially where there is good access to technology, and very well-established partnerships. The project team were in constant contact via a dedicated WeChat (the main social media platform in China) group, meaning that Oxford staff could be updated in real time of any challenges, and we could work as a team to address them.
- The co-design process was invaluable for producing nuanced, realistic intervention designs for reducing illegal wildlife use. Future projects aiming to change IWT consumption should include co-design elements with a broad range of stakeholders involved in the trade.
- It is essential to use robust surveys and interviews to understand the issues underpinning consumption more comprehensively– interventions based on assumptions (e.g. NGO claims that people were using more bear bile because they see it as a treatment for COVID-19) rather than evidence would not be appropriate.
- The importance of cooperation and co-leading projects with a local team and with local research assistants, who are more familiar with the context of local places and cultural nuances. This is especially true if the research assistants speak local languages (e.g., Cantonese in Guangdong), as this made the process much easier.

In addition, the key challenges were:

- The project period was extremely short and the time between notification of the award of the project and project completion included extended holidays in both the UK (Christmas) and China (Lunar New Year), meaning that administrative processes such as project set up and payments to staff were severely delayed at times. This affected some activities in China as payments were delayed, meaning that more activities were held later in the project than originally planned. Earlier notification of award of the project would have reduced some of these challenges, as would better adaptation to rapid-response project timelines by administrative processes in both partner organisations.
- COVID-19 restrictions in China were very different to the UK (much stricter, onset of new restrictions was more rapid), which meant that the project team had to be ready to adapt very quickly. We dealt with this by monitoring the local situation closely and having contingency plans for all activities. A related challenge was that the situation in China was much closer to 'normal' than in the UK, so restrictions placed on the project by Oxford for health and safety reasons were sometimes too strict for the reality in China. For example, we asked research assistants to stand 2 metres from respondents, but social distancing rules were not in place in the areas we were working in, so this was not practical.
- While technology did help, there were still difficulties in working remotely for some parts of the project. Due to the international travel and software restrictions, the expert on co-design workshops could not effectively attend or participate in conducting the workshops. This meant that the team had to spend much more time than expected to prepare and to facilitate these workshops independently.