



BioAirNet

A regulatory perspective

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EA Research – our task

- Support the Environment Agency and our Governmental partners in **minimising harm** caused to environmental and human health by the processes we regulate
- Contribute to improvement of environmental and public health more widely, **directly and by influencing**

Industrial emissions at sites we regulate

- “We will keep *driving down emissions* by continuing to apply *risk-based approaches* to permitting and regulation”
- “Using our sector groups we will require sites that we regulate to use the *best available techniques* where these are available”
- “We will continue to upskill our regulatory staff through a series of training courses and seminars to ensure we can *provide the best advice* to industry”
- We will support the regulatory process by developing protocols (including methods) that are *fit for purpose* but *proportionate* in resource terms
- For *bioaerosols* the main focus has been on *Biowaste* and *Agriculture*
- Matters *now* arising include *AMR* and *surveillance monitoring* (including SARS-CoV-2)

How do we get the research done

- In-house
- Wider cross-governmental collaborations
- Contractors
- Influencing, including Research Council spending

Bioaerosols - what do we need?

- Knowledge of **impacts** (does it matter?)

Impacts

- Much work done (in **partnership** e.g. with IoM, PHE, MRC, Cranfield, UWE, EU) but...
- Still **much uncertainty** on level of **harm** and **dose-response**. Forced to take **precautionary** rather than **risk-based** approach

E.g. *“To conclude, the majority of studies pointed towards a **negative impact on health outcomes**, particularly respiratory symptoms, among **farmers** exposed to bioaerosols. Studies investigating the health of **communities** living near intensive farms were more **mixed**. Further research is needed to measure and monitor exposure in community settings and relate this to objectively measured health outcomes. However, there was relatively consistent evidence of increased reported asthma among children living or attending schools near an intensive farm.”*

Douglas *et al* 2018

- “**mixed**” results possibly due to **paucity of exposure data** and **wider exposome context** (such as exposure from process contribution relative to **other outdoor** and **indoor** exposures)
- Poor understanding of **best metrics** – key allergens or pathogens (**speciation** only just beginning)

Bioaerosols - what do we need?

- Knowledge of **impacts** (does it matter?)
- Knowledge of emission **quality** and **quantity** (what and how much?)

Monitoring

What should we be monitoring?

- For **research**, on process and micro-environment contributions to **exposome** and its impacts
- For routine **regulatory** purposes (**cost** and **complexity** proportionate to **risk** but **robust, reliable, repeatable results** which are **persuasive** but ultimately **defensible** in court)
- Great strides made in **standardising methods** for ambient and source monitoring, but still challenges and inconsistencies, with cost and practical limitations especially for regulation
- Tantalising glimpses of what **real-time monitoring** might be able to offer
- Rapid **molecular genetic** and **immunological** methods showing promise once we can identify targets

Bioaerosols - what do we need?

- Knowledge of emission **quality** and **quantity** (what and how much?)
- Knowledge of **impacts** (does it matter?)
- What **mitigations** or **interventions** can bring harm down to an acceptable level

Regulation and permitting

Permits

- **when** are controls needed?
- **what** constitutes a **suitable control** – distance, dispersion, containment, filtration

Compliance monitoring

- *“There is no control without effective monitoring and measurement”*
- *“We will support initiatives, programmes and innovation to improve monitoring data for industrial emissions and air quality”*
- regimes for **source** and/or **receptor monitoring** needed
- to be fit for purpose

Success factors

- The **establishment** of a cohesive, collaborative and highly effective **inter-disciplinary research community** comprising of researchers, policy makers, industry and the wider stakeholder community
- Successful **contributions** to the **evidence base** for **policy** targets with the ongoing engagement and co-production of research with Government departments and devolved administrations
- The development of **new products** and **services** with meaningful engagement with businesses and uptake of those products and services by society

Benefits

- **The main benefits** of the Clean Air Programme are anticipated to be a strong UK reputation for world-leading research and **innovation** on air quality, improved **public health**, cost savings to health services and businesses through avoided health impacts, and **clean economic growth**.
- **Realisation of potential benefits** will be achieved through robust contributions to the evidence base of policy targets for national and transboundary emissions reductions, **health and environmental protection and infrastructure development**, stimulation of growth in relevant industry sectors, and alignment of Government, UKRI and Met Office Clean Air priorities.



What might we do together?

- Better understand the total exposome in order to understand what regulated processes contribute
- Better target the components of the bioaerosol which make the best metrics (direct or surrogate)
- Develop monitoring methods with price and complexity matched to application
- Understand how to mitigate risks