NATASHA'S PRIZE

A future without food allergy

Natasha's Foundation

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Foreword

"For the last 20 years, the food allergy epidemic has been escalating. Hospital admissions for food-induced anaphylaxis have more than tripled in the UK over 2 decades, with the biggest increase in children under 15.[1]

Food allergy blights lives, even for those who do not experience the most serious of medical emergencies.

With the £2.7 million Natasha Clinical Trial we are helping children who are already diagnosed with food allergy to experience a life without fear of a potentially fatal reaction.

We will never stop working to support people with food allergy.

But our vision is prevention.

With Natasha's Prize we want to accelerate progress in food allergy research.

10 years after Natasha's death, we remain determined to create meaningful change in her memory.

Our daughter would be so proud of her incredible legacy. Learning to live after her loss has been devastating.

We hope that one day, research undertaken in her name will stop anyone else from experiencing the grief we will always endure.

We believe it will enable people who would otherwise have been diagnosed with food allergy and all the challenges it brings to live full lives without limits; free from fear, heartbreak and harm.

With the brightest minds working together, and proper investment, we can make a profound impact and begin to get rid of food allergy for good."

Nadim and Tanya Laperouse OBEs, Founders of Natasha's Foundation

Natasha's Prize is a groundbreaking new £10 million ($13.5 million) global research prize to create a future without food allergy.

1. Turner et al, BMJ 2021 (www.bmj.com/content/372/bmj.n251)

Research strategy of
Natasha's Foundation

This year marks 10 years since the death of Natasha Ednan-Laperouse, whose tragic and preventable allergic reaction has led to lasting change in food allergy awareness and legislation in the UK.

As we mark this milestone, we also remember all those who have lost their lives to anaphylaxis, both before and after Natasha, and recognise the millions of people and families whose daily lives continue to be affected by food allergy.

To honour Natasha's legacy and drive continued progress, Natasha's Foundation is launching **Natasha's Prize** - recognising and supporting ideas, initiatives and individuals working to improve the safety, awareness and lived experience of those affected by food allergy.

The £10 million ($13.5 million) Prize reflects a continued commitment to prevention, education and innovation, with the aim of creating a future without food allergy.

"Natasha believed in kindness, inclusion and looking after others. Through Natasha's Prize, we want to fund research that can drive meaningful change and build a future where fewer families have to experience the pain and loss caused by food allergy.

This Prize is dedicated not only to Natasha, but to everyone whose lives have been touched by anaphylaxis and food allergy.

We want this Prize to be rooted in hope - encouraging scientists to think boldly, reach for the stars and believe that real change is possible. Progress often begins with ideas that once seemed impossible. Our hope is for a future that is safer, more understanding and ultimately free from the fear and harm caused by food allergy – a future without food allergy."

Nadim and Tanya Laperouse OBEs,
Founders of Natasha's Foundation

"What is exciting about Natasha's Prize is that it is looking at preventing allergies in the future for the next generation.

As kids are born, if they develop food allergies it can affect the rest of their lives. But if we can stop food allergy right from birth, they will have a completely different life.

So, this Prize is going to be amazing for so many people."

Dame Dr Maggie Aderin,
Space scientist and Ambassador for Natasha's Prize

Our vision

At Natasha's Foundation our vision is bold: we want to create a future without food allergy.

We work to support the millions of people with food allergy and their families by being their voice, raising awareness, advancing research, and striving for breakthroughs that will better protect them and help them navigate the challenges of living with allergic disease.

However, our ultimate goal is to **prevent food allergy before it starts** and create a future where generations to come can live free from food allergy.

Everyone should be able to live without the constant fear of life-threatening reactions and sudden hospitalisations.

Yet we know that for many people with food allergy, this is exactly how they live. Food allergy is not a choice or a preference - it is an unpredictable and potentially life-threatening medical condition.

And food allergy doesn't just affect individuals. It affects families, friends, schools, health services, the hospitality industry and business.

By launching Natasha's Prize, we hope to gain a more comprehensive understanding of the causes of food allergy - discovering how to reduce them and ultimately prevent them, so that future generations can live free from the burden they bring.

"If I didn't have food allergies, I wouldn't have to worry so much. I would feel really happy and free."

Jess Hoque, 9, who lives with a dairy allergy.

Equitable and fair access to treatment

We believe passionately that access to food allergy prevention treatment should be equitable and fair.

At present, in the UK, only the lucky few live in an area where they can access oral immunotherapy treatment (OIT) for free on the NHS – a treatment which can make people with food allergy tolerant to foods that previously posed a danger.

That's why our pioneering £2.7 million Natasha Clinical Trial has rolled out across 9 NHS hospitals, so more children and young people with food allergy can live without fear of a possibly fatal allergic reaction.

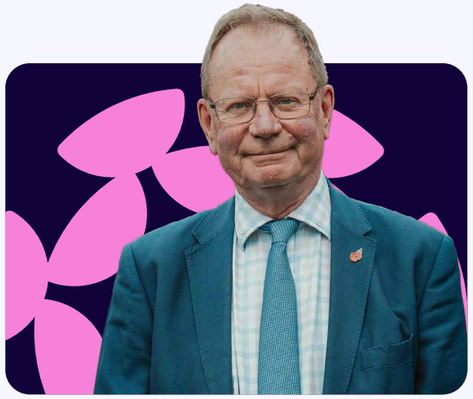
The solutions identified by Natasha's Prize must be made available to all who can benefit, regardless of their ability to pay.

Professor Sir Stephen Holgate CBE, Natasha's Prize Director and Clinical Professor of Immunopharmacology and Honorary Consultant Physician at the University of Southampton, is clear that Natasha's Prize offers a fresh new approach to food allergy research.

"Now is the time for a much needed kick-start to open up a new era in food allergy prevention, providing hope for the many people whose lives are blighted by food allergies.

We must identify the most effective interventions within the first 1,000 days - from conception to age 2 - the crucial window for prevention and adopt a completely new approach, involving people from all different scientific disciplines.

Natasha's Prize can be a catalyst for real change, by proving that prevention is possible."



Our mission

Natasha's Prize, a £10million ($13.5million) investment into global food allergy research, offers a once-in-a-generation opportunity to create a future without food allergy.

Scientists believe food allergy is preventable.

No baby is born with a food allergy yet over the last 2 decades rates have been rising around the world.

Huge advances in our understanding of the drivers of food allergy, combined with recent revolutions in AI, technological and data science, mean there has never been a better time to accelerate food allergy research.

The first 1,000 days has been chosen as it represents a critical window of opportunity to intervene to prevent food allergy.

By finding out more about the multitudinous and complex interplay of factors that influence the development of food allergy, we will be able to unlock the solutions to ultimately prevent them.

Natasha's Prize will ask the question:

What interventions can be made In the first 1,000 days, from conception to age 2, that could stop food allergy developing in the first place?

Our strategic research aims

The 3 key strategic research aims for Natasha's Prize are:

- Prevent food allergy deaths
- Reduce harm and heartbreak
- Improve quality of life

Prevent food allergy deaths

Natasha's Foundation was launched in 2019 by Nadim and Tanya Ednan-Laperouse OBEs after the death of their 15-year-old daughter, Natasha.

Natasha had a fatal allergic reaction to a baguette containing hidden sesame to which she was allergic. Sesame wasn't listed as an ingredient on the packaging despite being a known allergen.

Her death in 2016 was entirely preventable. **Every day, 14 people in the UK alone experience a severe food allergic reaction that puts them at risk of death.[2]**

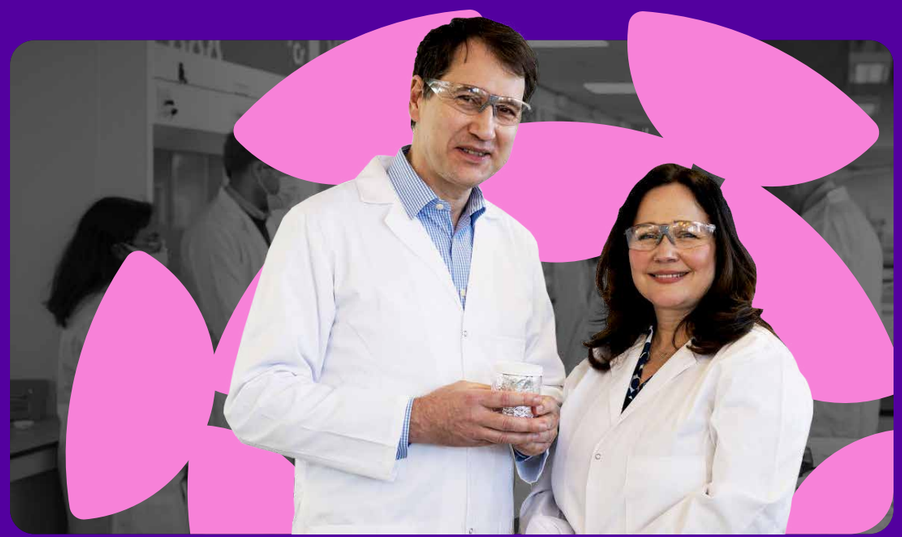
By concentrating on the first 1,000 days and how to prevent food allergy before it starts, Natasha's Prize could prevent more needless tragedy.

The research funded by the Prize will advance our understanding of the causes of food allergic disease and help reduce the rising number of food allergy cases, most of which are preventable.

"Natasha's Prize offers a once-in-a-generation opportunity to create a future without food allergy. It will fund research focused on turning back the dial on a disease that affects millions of people both in the UK and around the world, leaving many living in fear.

We want to galvanise the best science to stop food allergy before it starts, so no other families have to go through the heartbreak we will always endure."

Tanya and Nadim Ednan-Laperouse OBEs



2. MHRA 2023 (www.gov.uk/government/news/mhra-reinforces-anaphylaxis-emergency-guidance-as-hospital-admissions-rise)

Reduce harm and heartbreak

Food allergy has doubled in a decade and disproportionately affects children.[3]

Hospital admissions for food allergy and severe anaphylaxis have surged, doubling over the 20 years, highlighting the increasing seriousness and prevalence of food allergic reactions.[4]

Beyond the physical risks, the emotional toll on families is significant. 40% of parents of food-allergic children experience moderate to extremely severe anxiety about their child's condition and safety.[5]

80% of parents of children with food allergy experience "significant worry" about them, while 42% met the clinical cut-off for post-traumatic stress symptoms.[6]

The goal of Natasha's Prize is to find practical, scalable, real-world solutions for food allergy prevention, to end unnecessary harm and heartbreak.

Natasha's Prize offers the hope that future generations will be able to live free from food allergy.

"From the moment Jenson arrived in the world, I knew I had been blessed with the most incredible baby boy.

Jenson built a beautiful life for himself in York after studying for both his degree and Master's at St John University. I was so proud of everything he achieved and looked forward to watching his life continue to unfold.

Living without him is unbearable, and I pray every day that wherever he is, he is safe and at peace."

Lex Metcalfe, mother of Jenson, 21, who died from sudden anaphylaxis in his sleep.

3. Turner et al, Lancet 2024 (www.thelancet.com/journals/lanpub/article/PIIS2468-2667(24)00163-4/fulltext
4. MHRA 2023 (www.gov.uk/government/news/mhra-reinforces-anaphylaxis-emergency-guidance-as-hospital-admissions-rise)
5, 6. UEA 2021 (https://research-portal.uea.ac.uk/en/publications/parental-anxiety-and-post-traumatic-stress-symptoms-in-pediatric-/)

Improve quality of life

People with food allergy, and their loved ones, live with fear every single day.

Food allergy has a profound, insidious and devastating effect on quality of life, affecting not only physical and emotional health but also having a far-reaching impact on everyday activities.

Families often live in constant fear of life-threatening reactions and sudden hospitalisations. Simple acts such as doing a supermarket shop become a fraught and complicated process, marked by frantically re-checking labels and hunting for 'safe' options.

Children and young people with food allergy may develop anxiety around food and feel excluded at school, work, or college. Some struggle to participate fully in social activities, while events involving food can feel isolating and stressful for them.

This ongoing fear and vigilance can lead to social isolation, reduced confidence, and a significant emotional burden for both individuals and their loved ones.

Given the huge toll on people living with food allergy, their families and the NHS, it has never been more important to create a future without food allergy.

Natasha's Prize aims to support research that delivers tangible improvements in everyday life for people living with food allergy, while also helping to drive behavioural and policy change to build a society where people with food allergy can live without limits.

"I have lived with life-threatening anaphylactic allergies since birth, and it is something that has shaped not only how I live, but who I am. I am allergic to eggs, all nuts, all seeds, chocolate, buckwheat, kiwi, and dairy, as well as dust and pollen.

I have experienced anaphylaxis more times than I can count, and there have been moments where, without my EpiPen and the quick actions of those around me, I would not be here today. Living with that reality changes you, it makes you constantly aware of how fragile safety can be."

Jessie Flaum, 22.

"My sons all have food allergy. Jess told me another child said he could not come to a birthday party because of his allergy.

Jude was told, 'Having allergies just means you do not like it', and later had yoghurt shoved in his face.

These experiences cause deep anxiety and sadness."

Billie Hoque, mother of 3 children with food allergy

Food allergy: a global crisis

Around 220 million people worldwide live with food allergy.[7] While rates vary from country to country, food allergy is on the rise almost everywhere.

In the UK, around 3 million people have food allergy, and hospital admissions for severe food allergic reactions have more than tripled in the past 2 decades, with young people most affected.

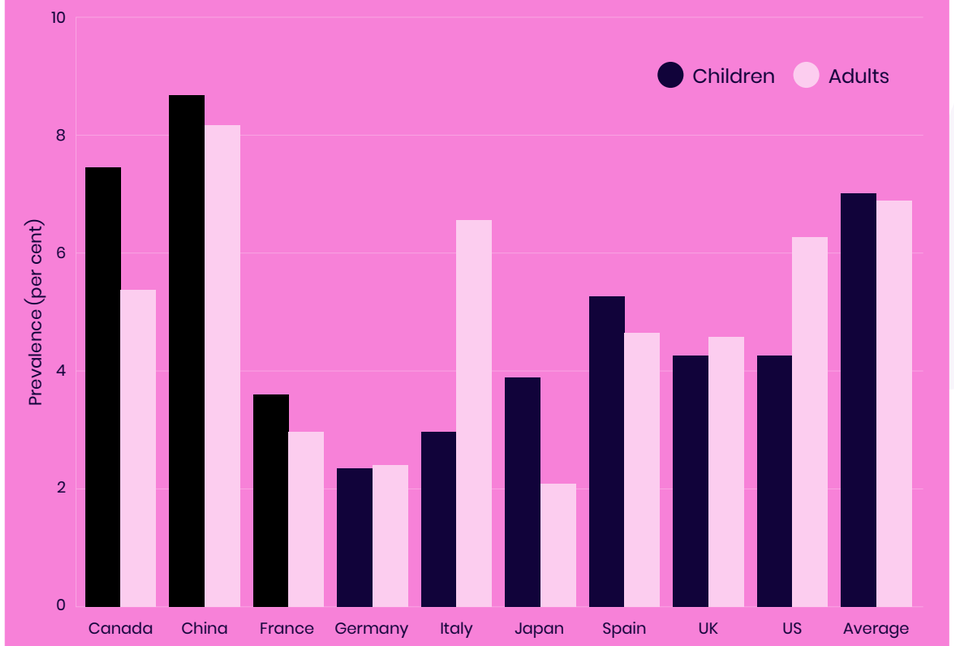
Known risk factors contributing to the rise in food allergy include climate change, decreasing biodiversity, indoor and outdoor air pollution, poor housing, diet, specific genes and a depleted microbiome.

Most of these factors are increasingly global problems.

China now has the highest rate of food allergy among children[8] while food allergy has increased by 70% in just a decade in children under 6 in Japan.[9]

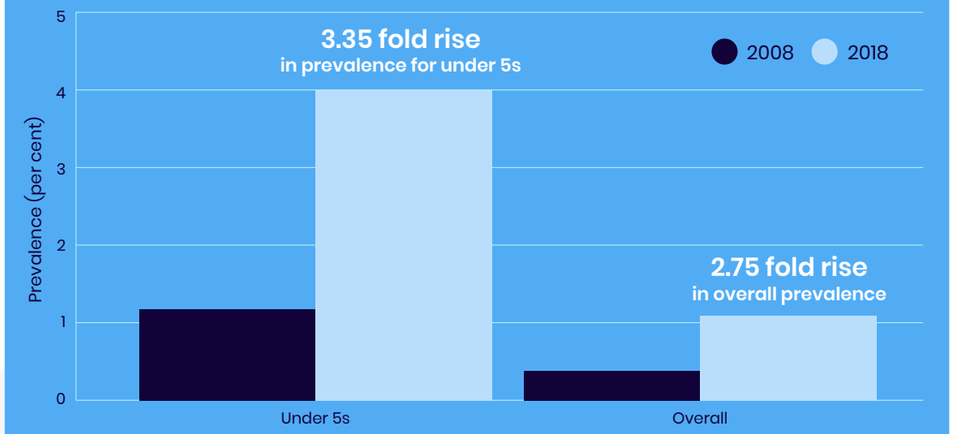
So it has never been more pressing to understand what is fuelling the food allergy epidemic, and to establish how to stop it.

Graph 1: Self-reported food allergy prevalence in major economies



Note: Average calculated as a population weighted average. Source: Gupta. R, et al, Global prevalence of pediatric and adult IGE-mediated food allergies: Results: From the ASSESS FA study, 2023.

Graph 2: Growth in food allergy prevalence in England (2008 - 2018)



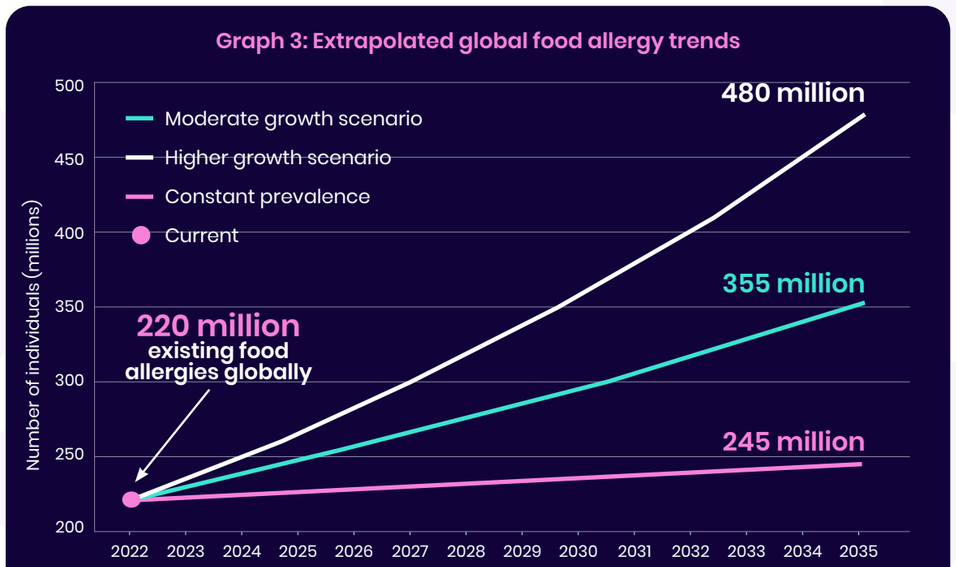
Source: Turner at al. The Lancet (2024). Time trends in the epidemiology of food allergy in England: an observational analysis of Clinical Practice Research Datalink data.

Significant growth in food allergy is expected over the next decade

If the increase in prevalence rates seen in the U.S. and UK over the last 2 decades continues and is replicated in other countries too, food allergy rates could rise to **480 million cases globally by 2035.**

In our ever-more globalised world, food allergy must no longer be seen as a periphery issue.

Graph 3: Extrapolated global food allergy trends



Source: FAO, UN population projections and independent analysis.

7. World Allergy Organisation 2021 (www.worldallergyorganizationjournal.org/article/S1939-4551(21)00092-2/fulltext)
8. World Population Review 2026 (https://worldpopulationreview.com/country-rankings/allergy-rates-by-country)
9. Yoshisue et al, PAI 2024 (https://onlinelibrary.wiley.com/doi/10.1111/pai.14192)

Food allergy is becoming more complex and severe

- The prevalence of allergy to ingested and environmental exposures has increased dramatically in recent decades, particularly among children.
- Severe allergic reactions, including anaphylaxis, are unpredictable and can be life-threatening.
- Food allergy places a heavy burden on individuals, families and healthcare systems.
- While we now know that no baby is born with food allergy, we don't yet have any complete interventions to prevent food allergy before it starts.
- Diagnoses for food allergy doubled between 2008 and 2018, with the largest increase seen in young children.[10]
- Hospital admissions for severe allergic reactions to food have more than tripled in the last 20 years in the UK, with young people the most affected.[11]
- While food allergy deaths are rare, around 10 people die from food-induced anaphylaxis every year in the UK.[12]
- Food allergy is the most prevalent cause of anaphylaxis, accounting for 30% of all emergency hospital admissions for the life-threatening allergic reaction.[13]
- Cows' milk is now the most common cause of food allergy deaths in children, accounting for 26% of deaths.[14]

10. Turner et al, Lancet 2024 (www.thelancet.com/journals/lanpub/article/PIIS2468-2667(24)00163-4/fulltext)
11, 12, 13, 14. Turner et al, BMJ 2021 (www.bmj.com/content/372/bmj.n251)

The need for urgent change

Food allergy is a chronic condition; complicated, unpredictable, dangerous and debilitating.

With food allergy so sharply on the rise, it is essential we uncover more about it.

However, the food allergy field is hugely under-funded and the rate of research is not keeping up with the rise in cases. Ultimately, this is costing lives.

It is vital that major new studies into food allergy are fully funded, now.

With the right investment, science could halt the food allergy explosion that is threatening our children.

That is why we launched Natasha's Prize - to drive urgently needed investment into innovative, practical, and scalable research that can deliver real-world solutions for food allergy prevention and improve everyday life for those impacted.

Together, we can create a future without food allergy.

Food allergy in numbers

1 in 13 children has a food allergy[15]

6% of UK adults have a diagnosed food allergy[16]

20% of children with a food allergy have an allergic reaction in school[17]

43k new cases of allergy emerge in the UK each year via new births[18]

15. FSA 2016 (fifth-csa-report-allergy (1).pdf)
16. FSA 2024 (https://www.food.gov.uk/print/pdf/node/23341)
17. Muraro et al 2010 (https://pubmed.ncbi.nlm.nih.gov/20345502/)
18. Hansard Vol 702 2021 (https://hansard.parliament.uk/commons/2021-10-29/debates/5377A999-7077-4D82-AD1A DA85F4446617/NHSAllergyServices)

Delivering a future without food allergy

While a future without food allergy is possible, the exact nature of the scientific challenge remains unresolved.

- Despite major advances in immunology; such as the discovery of immunoglobulin E (the allergy antibody), type 2 lymphocyte immunity and regulatory lymphocytes; the fundamental processes that lead to the emergence of the allergic state (which includes food allergy) are still poorly understood.
- The interplay between genetics, the immune system, diet, environment and the gut and lung microbiomes is complex and requires multidisciplinary investigation.
- Significant knowledge gaps hinder the development of prevention strategies, diagnostics, and long-term treatments.

The field of food allergy research is packed with bright minds and promising ideas, but vastly underfunded.

In the past few decades alone, much of what we thought we knew about food allergy has been turned on its head.

For years, for example, parents were told to delay giving babies "allergenic" foods such as peanuts. That advice has changed, and we now know that an early introduction of peanuts can actually help prevent children from becoming allergic.[19]

Bright minds. Bold ideas. Breakthrough solutions.

With the right people in the right room, countless more game-changing discoveries are within our grasp.

We need to unite a cross-disciplinary allergy science super team from across the globe, with proper funding behind it.

This is something Natasha's Prize can do.

Scientists from across the world from all different disciplines – such as allergists, AI data analysts, dietitians, engineers, social and environmental scientists, microbiologists and epidemiologists - are invited to apply for Natasha's Prize.

A Global Food Allergy Science Alliance

Food allergy in early life is a systems problem. We need bold interdisciplinary teams to address it holistically, with a focus on prevention, global equity and early-life intervention strategies.

Natasha's Prize aims to build a Global Food Allergy Science Alliance which, through collective excellence, can advance food allergy research with ideas that have the potential for high impact.

"With a complex condition like food allergy we need a completely new approach, involving people from all different disciplines and that is what Natasha's Prize is seeking to achieve."

Professor Sir Stephen Holgate CBE, Natasha's Prize Director

The urgent need for a systems-level, co-ordinated research approach

- Food allergy research is under-funded in comparison with other chronic conditions.
- Given the complexities around food allergy, a systems approach could best unlock research opportunities. This would integrate immunology, epidemiology, nutrition, environmental science, data science and more.
- Collaborative research infrastructures, biobanks and data-sharing frameworks could all help to further accelerate progress.

19. Lack et al, N Engl J Med 2015 (https://www.nejm.org/doi/full/10.1056/NEJMoa1414850)

Building a long-term global research capacity

- Allergy, including food allergy, is not confined to high-income countries.
- Global collaboration will ensure equal access to research findings, interventions, and policy responses.
- Investment in training and infrastructure will strengthen scientific capacity.

Food allergy was once almost unheard of in lower-income countries. But in our increasingly globalised, urbanised and ecologically imbalanced world, food allergy is on the rise everywhere.

A future without food allergy is good for us all.

Societal and economic benefits of investment

There is a moral imperative to end food allergy, to prevent ill health and tragedy.

But investment now will also ultimately save huge amounts of money for healthcare systems, businesses, governments and families.

Food allergy households in the UK spend 20% more a year on groceries (£1,100 million more in total) including free-from foods, than other households.[20]

70% of UK parents of children with food allergy also report that their child has missed school due to their condition.[21]

- Research-driven policy interventions can improve food labelling, risk management, and public health awareness.
- Funding food allergy research is not only a scientific necessity but also a social and economic imperative.
- Effective prevention and treatment strategies could reduce healthcare costs, reduce school and workplace disruptions, and cut down on anxiety and emotional distress for affected individuals and families.

20. Bain/NARF 2022
21. NARF survey 2025

The first 1,000 days

Why focus on the first 1,000 days?

Natasha's Prize focuses on the first 1,000 days — from conception to age 2 — because this critical window is when the immune system is being programmed and trained to correctly identify threats.

Our immune system begins developing in the womb. It continues maturing after birth, as babies move from relying on maternal antibodies to building their own immune responses.

Throughout these crucial early months, the immune system is at its most responsive to shaping.

Before, during and after birth, the immune system is learning these important lessons all the time, through exposure to environmental factors, food and bacteria.

This is when it should learn to tolerate harmless substances, including common food allergens such as peanuts, milk or eggs.

However, in people with food allergy, this process goes wrong.

The immune system incorrectly thinks that innocuous food allergens are dangerous and triggers a "protective" immune reaction where none is needed.

But scientists now hope they might be able to actively shape and train the immune system to prevent allergies developing, by shaping early exposures before birth and in the first months of life.

This is why Natasha's Prize is focused on the first 1,000 days.

It will find new ways to harness this vital early window of opportunity and move us closer to a future without food allergy.

Natasha's Prize: The Research Question

What interventions can be made in the first 1,000 days, from conception to age 2, that could stop food allergy developing in the first place?

To answer this question we're inviting the brightest, boldest and most disruptive minds in the field to focus on this period.

This quest was sparked by the scientists who gathered at the Global Allergy Symposium, hosted by the then Prince of Wales, HRH The King, in September 2022.

The first 1,000 days: 5 research priority areas

1

Strengthen understanding of epithelial barrier integrity

Identify those biological, microbial, and environmental factors that support or disrupt gut, skin and epithelial development in early life.

2

Elucidate mechanisms of immune programming and tolerance

Determine how genetics, maternal diet during pregnancy, microbial exposure and immune regulation shape tolerance to food antigens.

3

Integrate environmental and ecological determinants of allergy

Explore how early exposure (or lack of exposure) to nature, biodiversity and different environments influences allergy risk.

4

Harness data science and omics for systems-level discovery

Leverage biobanks, multi-omics platforms, data, machine learning and artificial intelligence to interrogate complex interacting processes to model early immune trajectories and predict allergy risk.

5

Promote global equity and paradigm shifts in allergy research

Build diverse, inclusive research cohorts and strengthen capacity in underrepresented regions and countries.

Research ideas for investigation

In July 2025, we asked Professor Holgate, Natasha's Prize Director, and the 10 members of our Scientific Advisory Panel to identify 4 to 6 novel ideas, themes, or research directions they would be most excited to see emerge from the Thinkery.

Below are the key areas of interest, emerging priorities, and shared ambitions. identified by the panel and Global Allergy Symposium.

Epithelial barrier function

The epithelial barrier is a protective layer of cells lining the skin, gut, lungs and blood vessels.

It is becoming increasingly clear that the degradation and disruption of this barrier, as a result of modern living, might play a major part in several chronic conditions including food allergy.

Science must find out what supports (and what disrupts) epithelial development, especially in the first 1,000 days.

- What role do early-life exposures to toxins, skincare and microbes play?
- Can we model the barrier function in infancy?

While research in this field has widely been focused on gut health, Professor Miriam Moffat, Professor of Respiratory Genetics at the National Heart and Lung Institute at Imperial College, believes our lung microbiome could be key.

"In the future, it may be possible to treat allergies and lung conditions by rebalancing the lung microbiome."

Miriam Moffat, Professor of Respiratory Genetics at the National Heart and Lung Institute at Imperial College

Immune programming and tolerance

The first 1,000 days are imperative, because they are a critical window of opportunity in which we may be able to influence the development of the immune system.

Pregnant women are no longer told to avoid nuts, but we still don't fully understand the impact of maternal diets on babies in the womb.

- Could probiotics in pregnancy affect immune tolerance?

Professor Cathy Thornton, Professor of Human Immunology at Swansea University in Wales, states that exposure to a variety of factors in the womb and early childhood can influence the programming of our organs and the immune system, making the development of allergy and asthma more likely.

These include tobacco smoke, air pollution, whether a mother has allergies herself and her microbiome.

- What steps could women take during pregnancy to help safeguard their unborn child from allergic disease?

Professor Gideon Lack, Professor of Paediatric Allergy at King's College London, has spearheaded research suggesting that earlier introduction of allergens can help prevent food allergy.

He suggests we need a randomised controlled trial to work out the optimal timing and dosage of peanut protein an infant should consume to prevent a peanut allergy.

- Could we prove that changing current NHS weaning guidelines, which don't encourage any introduction of food until babies are 6 months old, would dramatically alter the childhood allergy trajectory in the UK?

"There is strong scientific evidence that regular consumption of peanuts from aged 4 to 6 months until the age of 5 will prevent more than 80% of new cases of peanut allergy.

Most other food allergies can also be prevented by regularly eating food allergens during this key period of 4 to 6 months of age."

Professor Gideon Lack, Professor of Paediatric Allergy at King's College London

Nutrition and milk-derived protection

Repeated studies from around the world have shown that children in more rural environments, especially farm settings, are far less likely to develop food allergy.

The protective effect is attributed to exposure to beneficial bacteria and fungi in the early years of life, which are abundant in such environments.

Bacteria found in cow sheds and unprocessed raw cows' milk create a diverse microbiome in the respiratory tract and gut which in turn trains the immune system not to react to allergens.

Spending just 20 minutes a day in a cow shed in the early years of life was associated in a study by Dr Erika von Mutius, Director of the Institute of Asthma and Allergy Prevention at Helmholtz Centre, Munich, with more than an 80% lower risk of allergies.

- How might we harness the benefits of raw milk while balancing the public health necessity for processed milk?
- How can we identify the protective bioactive compounds in raw milk and farm environments, and use them to help the majority of children, who do not grow up in farm-style surroundings?
- Could we redesign infant formula with retained immunity, for the many mothers who cannot or choose not to breastfeed?

"We now need to identify the precise compounds that provide protection from allergies. It's most likely to be a cocktail of compounds, rather than one magic ingredient."

In the future, it could mean using a nasal spray or taking a tablet."

Dr Erika von Mutius, Director of the Institute of Asthma and Allergy Prevention at Helmholtz Centre, Munich

Nature and ecosystem exposure

Dr Tari Haahtela, Professor Emeritus of clinical Allergology at Helsinki University Hospital who spearheaded the seminal Finnish Allergy Programme between 2008 and 2018, has showcased how exposure to biodiversity and lower air pollution can vastly reduce allergy on a population level.

Allergy may be a marker of ecological disconnection.

Research must show how we can leverage this knowledge to help children in the first 1,000 days; including in more densely populated and polluted areas.

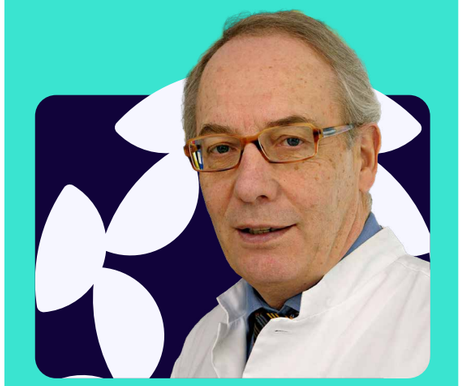
- Could ensuring green space access in infancy reduce allergy cases? (How might this look, can small school 'mud kitchens' play a part?)
- Can policy strategies align allergy prevention with biodiversity goals?
- What effects do the interaction of different shifting environments (such as air quality, weather extremes and environmental chemicals) have on the development of allergy?
- How can public awareness influence exposure to and the effects of allergens?

For example, Professor Sir Stephen Holgate CBE, Medical Research Council Clinical Professor of Immunopharmacology at the University of Southampton, states that the public is largely currently unaware of the importance of indoor air pollution.

"To reverse the rise in allergies we need to stop biodiversity loss and climate change.

We must encourage people to eat a diet rich in fresh fruit and vegetables, exercise in natural environments (where possible) and ensure housing is close to green spaces."

Dr Tari Haahtela, Professor Emeritus of clinical Allergology at Helsinki University Hospital



Data omics and sampling strategies

Research must leverage biobanks, AI and health datasets to accelerate and expand understanding of allergy in the first 1,000 days.

- How can we use multi-omics and machine learning to model early immune risk, and what essential questions might we then answer?
- Can we utilise new and less invasive ways to collect biological samples from babies in order to look at immune system activity?

"Machine learning (ML) or artificial intelligence (AI) may offer a new potential solution. These modern data analysis techniques can digest large amounts of data quickly and identify hidden patterns that humans cannot find."

Professor Adnan Custovic,
Professor of Paediatric Allergy at Imperial College London

Global equity and paradigm shifts

Most allergy research to date has focused on patients of white European ancestry, but allergy is a global epidemic.

"Investigating the relationship between genetics and the environment is also important because people will have different exposures to allergens depending on where they live and their lifestyle.

Across the world, there are strong links between races and ethnic groups and lifestyle including housing, access to healthcare and local environment."

Professor Deborah A Meyers,
Professor of Medicine at the University of Arizona

Children from other ethnic backgrounds are more likely to have food allergy than white children in the UK.

People who identify as Black/Afro Caribbean, South Asian, Middle Eastern or other ethnicities are also much more likely to have a food allergy than white individuals.[22]

These disparities are likely to be down to a complex interplay of biological, environmental, social and healthcare factors - but we need to drill down into this.

Research could:

- Build far more diverse cohorts, especially in under-represented populations.
- Deploy a discovery and validation team model to continually test research findings across populations.
- Challenge Western-centric "skin-gut axis" allergy models (which might fail to incorporate variations in lifestyle, housing, healthcare and more, particularly in the early years).

22. Subramanian A et al, Clin Exp Allergy 2021 (https://pubmed.ncbi.nlm.nih.gov/32946613/)

Natasha's Prize and strategy shaped by lived experience

At Natasha's Foundation, we believe the voices of people affected by food allergy should shape everything we do.

Natasha's Army

Through Natasha's Army - a community of people with food allergy and those impacted by it - lived experience helps guide our research, resources, campaigns and policy work.

Natasha's Army supports the Foundation by sharing personal experiences, giving feedback on projects and campaigns, and taking part in active challenges, online discussions and surveys.

Working with and supporting families affected by food allergy

Lived experience is critical to the development of Natasha's Prize and will be embedded throughout the Prize process. It shaped our research strategy, helping to ensure our research goals align with the hopes, fears and experiences of people living with food allergy.

Lived experience can help ensure research findings create meaningful change in the real world, build trust in science and encourage participation in trials, and highlight important cultural or lifestyle factors that a purely clinical approach might otherwise miss.

We want our work to be not only scientifically robust, but also meaningful, relevant and useful to the people it is designed to support. By involving those affected by food allergy directly in research and decision-making, we can ensure our work reflects real-world needs and helps drive progress towards a future without food allergy.

Members of our food allergy community will therefore play an active role in the assessment process for Natasha's Prize. They will join the opening session of the Thinkery to help ground the event in its purpose, set the tone for discussions and provide direct patient and public perspectives.

They will also return for the final presentations to participate in discussions and contribute to the assessment process, focusing on patient relevance, likely engagement and how clearly proposals are explained to a lay audience.

If you are interested in joining Natasha's Army sign up by scanning this QR code >>

Priority setting partnership on food allergy in children

Launched in 2024 and funded by the National Institute for Health and Care Research (NIHR), the **Food Allergy in Children Priority Setting Partnership (PSP)** was led by the University of Bristol's Centre for Applied Excellence in Skin and Allergy Research (CAESAR) in partnership with **James Lind Alliance** to identify unanswered research questions about childhood food allergy by engaging directly with those most affected.

Natasha's Foundation was proud to be a core steering group member of the Food Allergy in Children PSP.

The aim of this PSP was to ensure future food allergy research is shaped not only by researchers and funders, but also by the experiences and priorities of those living with the condition every day.

The partnership aimed to guide future research priorities and funding towards the issues that matter most to children and young people with food allergy and their families, while helping to identify remaining gaps and unmet needs.

The PSP launched a survey for children and young people with food allergy, their parents and carers, and healthcare professionals.

It received more than 2,500 unanswered questions for research within the scope of the PSP. These were then refined and prioritised down to 51 key unanswered questions, before a final Top 10 research priorities list was agreed.

The final Top 10 research priorities were published in October 2025 and included prevention, earlier diagnosis, safer and more effective treatments, emergency care, improving awareness and inclusion, and understanding the emotional and social impact of food allergy.

The PSP also highlighted the importance of involving patients, carers and clinicians in shaping future research priorities.

The top research question identified by the Food Allergy in Children PSP was:

"What are the safest, most effective and cost-effective ways to prevent food allergy in children?"

As a member of the PSP, Natasha's Foundation helped bring the voices of food-allergic families into the process of identifying the most important unanswered research questions in food allergy.

The PSP highlighted prevention as the highest research priority, reflecting the hopes and concerns of families living with food allergy and the urgent need for clearer evidence on how food allergy can be prevented safely and effectively.

This lived experience-led process helped shape the agenda for Natasha's Prize, which focuses on prevention during the first 1,000 days - from conception to age 2 - a critical window in early life where there is significant potential to reduce the risk of developing food allergy.[23] [24]

23. JLA 2025 (https://www.jla.nihr.ac.uk/priority-setting-partnerships/food-allergy-children#tab-about-this-priority-setting%20partnership)
24. University of Bristol 2026 (https://foodallergyinchildrenpsp.blogs.bristol.ac.uk/about)

Natasha's Prize: 3 step process

1
People

A global call-out for game-changing individuals from all different disciplines

2
Ideas

We will invite up to 35 applicants to come and develop their ideas in a research sandpit – our Prize *Thinkery*.

3
Proposals

Emerging ideas submitted as detailed proposals

The Thinkery

The Natasha's Prize Thinkery will take place over 3 days from Tuesday 20 to Thursday 22 October 2026.

The Thinkery - our research sandpit - will provide a platform to unite the world's brightest minds to spark bold ideas and breakthrough solutions

Experts from different disciplines will be encouraged to think outside the box and work together to find new ways to prevent food allergy before it starts.

By leveraging this collaborative approach, we can develop groundbreaking ideas, refine methodologies, and increase the potential for transformative discoveries.

This model should ensure the development of real-world, scalable solutions.

We are looking for scientists ready to challenge convention and be part of something truly groundbreaking: a global effort to change the future of food allergy prevention for generations to come.

Breakthrough solutions

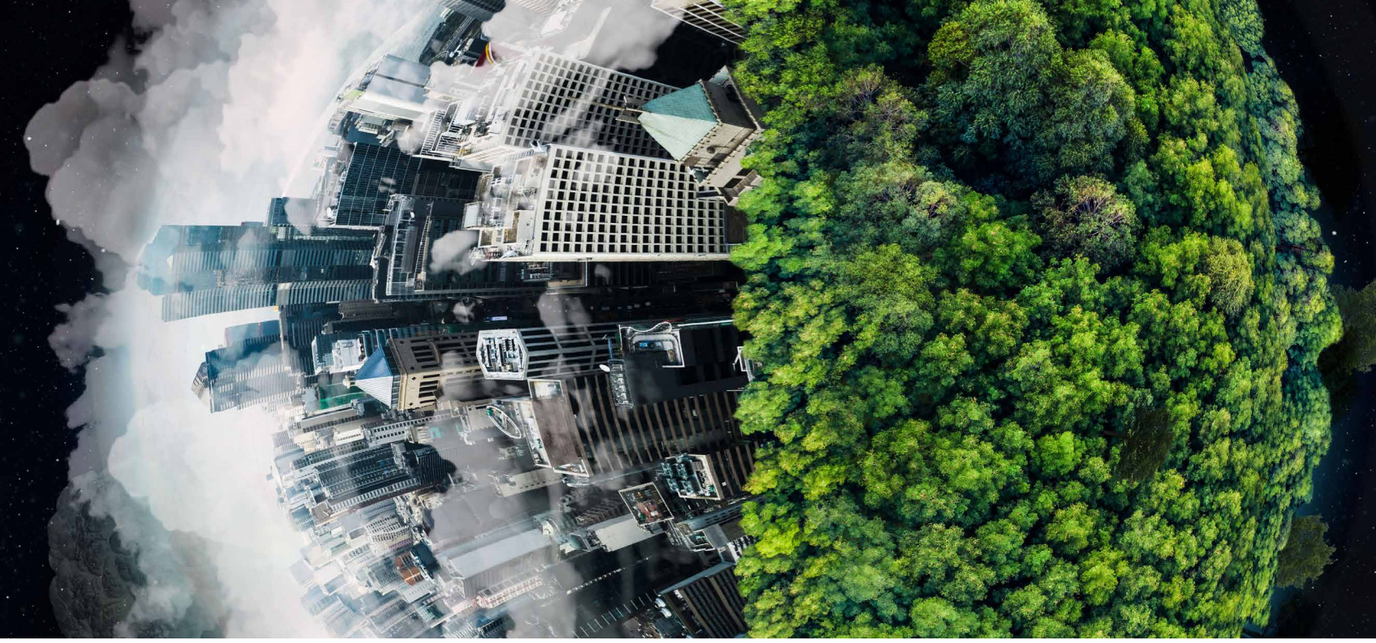
After the Thinkery the emerging ideas will be developed into full, detailed proposals.

These proposals will be evaluated on scientific excellence, feasibility and long-term impact, with the leading proposals needing to demonstrate clear pathways to meaningful real-world impact.

Our Prize Director and Thinkery mentors, together with **The Collective,** our professional facilitators, will lead the Thinkery. Our Scientific Advisory Panel, with input from representatives from Natasha's Army, will peer-review applicants and proposals, oversee the process and make recommendations to the Foundation's Trustees.

Natasha's Prize is open to experts from every discipline. If you have a bright mind, bold ideas, and believe your science could help transform our understanding of how food allergy begins - and ultimately how it can be prevented - we want you to apply.

The Global Allergy Symposium: the roadmap to Natasha's Prize

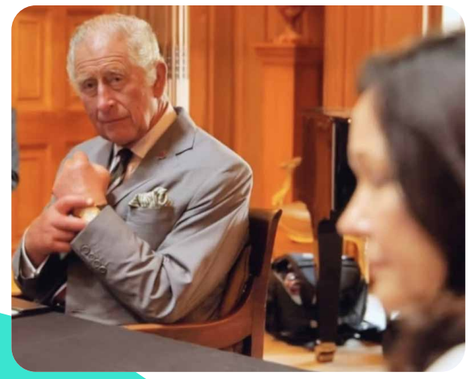


Natasha's Prize was first set in motion in September 2022, when HRH The King (then the Prince of Wales) hosted a Global Allergy Symposium at Dumfries House, headquarters of The King's Foundation.

Led by eminent allergy expert Professor Sir Stephen Holgate CBE and organised by Natasha's Foundation, the landmark 2-day event invited 16 renowned global scientists to explore the drivers of the allergy epidemic.

While the findings which emerged from the summit were diverse, there was one important consensus: **Allergy is preventable, and a future without allergy is possible.**

The Global Allergy Symposium outlined the blueprint for Natasha's Prize.



What is driving the allergy epidemic?

Allergic disease – including food allergy - is the result of a complex mixture of genetic and environmental factors, which interact to alter the immune system.

These factors include:

- Decreasing biodiversity
- Climate change and environmental shifts
- Indoor and outdoor air pollution
- Poor housing (for example damp and mould)
- Modern Western diets (significantly, ultra-processed foods)
- Specific genes
- A depleted microbiome (the trillions of bacteria and viruses that live inside our bodies).

Over recent decades, our changing way of life has altered the environment our immune system evolves in.

Industrial farming methods, climate change, the use of chemicals and pollution have all affected the diversity of microbes in our soil, air and water - and also, those in our bodies.

At the same time, many of us spend less time in nature. As a society we eat more ultra-processed foods, and our exposures to beneficial microbes during early life have decreased.

As a result, vital microbes that once helped to train our immune system to know the difference between, say, a dangerous parasite and a peanut protein, are rapidly disappearing.

In the face of such complex, extensive and deeply embedded changes it could be easy to feel overwhelmed. But science holds up hope.

With a deeper understanding of allergic disease will come new ways to treat patients and stop food allergy from ever developing.

Professor
Sir Stephen Holgate

Medical Research Council Clinical Professor of Immunopharmacology, University of Southampton, UK.

Stephen Holgate has had a lifelong interest in asthma and allergic diseases. He has published more than 1,000 peer review papers, was the inaugural chair of the Department of Health Committee on the Medical Effects of Air Pollution, Chair of the DEFRA Expert Panel on Air Quality Standards and a Member of the Royal Commission on Environmental Pollution. He is currently Principal Investigator of the UKRI Clean Air Champion programme overseeing a £42.5m investment in air pollution research and is Special Advisor to the Royal College of Physicians on Air Quality.

We often think of air pollution as being outdoors - car fumes and factories pumping out waste. Yet, on a broader front, indoor air pollution is just as much of a problem.

COVID was a clear example of this. Research showed children in classrooms with no ventilation shared each other's breath within 6 to 8 minutes. It meant if someone in the classroom had COVID, within half an hour everyone was exposed.

Breathed indoor air is a mixture of outdoor and indoor particles - pollutant gases combined with the airborne particles containing primary and secondary chemicals, allergens and microorganisms (including bacteria, viruses and fungi).

The indoor home environment contains lots of pollutants - mould, gas from hobs and heaters, chemicals produced by cooking, cleaning and furnishings. For example, the average British home contains 1.6 kilos of flame retardant in curtains, carpets and sofas.

In fact,it has been stated that the indoor home environment is 5 times more polluted that outside, making it a significant threat to human health - possibly greater than outdoor pollution. It is also the place where we spend most of our time.

Studies show that air pollution contributes to so many chronic diseases including osteoporosis, infertility, dementia and cancer. Allergic diseases are especially linked to indoor air pollution, yet we know so little about which pollutants are the main triggers, and their sources.

Next steps

Exactly how indoor air pollutants interact with other risk factors to trigger allergic and other diseases is still not fully understood, although it is thought the chemicals interact with the human genome to increase susceptibility.

Nor do we know yet the quantities of pollutants and how long it takes for indoor air pollution to initiate an allergy or other chronic disease.

However, improving air quality in our homes will undoubtedly reduce the risk of allergies developing and we should therefore be taking steps personally and as a society to achieve this goal. The current disease guidelines do not go far enough on this key aspect of prevention.

Professor
Tari Haahtela

Professor Emeritus of clinical Allergology at The Skin and Allergy Hospital, Helsinki University Hospital and the University of Helsinki, Finland.

Dr Tari Haahtela is a specialist in allergy and pulmonary medicine. Between 1994 and 2004, he chaired the Finnish Asthma Programme, and between 2008 and 2018 the Finnish Allergy Programme. His research team has studied the environmental and lifestyle determinants of allergy and asthma in Finnish and Russian Karelia communities. This resulted in the biodiversity hypothesis of asthma and allergy, and health in general.

The rise in allergy can be largely attributed to changes to our lifestyle and living environment.

Known as the biodiversity hypothesis, it suggests that while contact with natural environments and a diet rich in fresh fruit and vegetables enrich the human microbiome (the trillions of bacteria and other microbes that live in our bodies), promote a healthy immune system, and protect from allergy and inflammatory disorders, the opposite gives rise to allergic disease.

The biodiversity theory was implemented in a 10-year public health campaign called the Finnish Allergy Programme which ran from 2008 to 2018.

Focus was placed on endorsing health, strengthening tolerance to allergens, and treating severe allergies early. During this period, the 5.5 million residents of Finland were encouraged to stop smoking, exercise outdoors more, and eat a plant-rich diet. Air quality was also improved.

At the end of the Programme, hospital visits for asthma had dropped by 50%, and the number of children in day care and schools with a food allergy decreased by half. Occupational allergies were reduced by 45% and €1.2 billion savings to society were made over the decade.

Separately, there has been not a single death in children from anaphylaxis in Finland for 17 years (1996 to 2013).

The Finnish city of Lahti, the EU green capital 2021, has now adopted a similar approach. The local hospital has recruited a 'planetary health doctor' to drive forward holistic improvements in public health and the environment, preventing not only allergic disease but also diabetes, obesity and depression.

Next steps

Closer collaboration between medicine and ecology.

To reverse the rise in allergies we need to stop biodiversity loss and climate change.

We must encourage people to eat a diet rich in fresh fruit and vegetables, exercise in natural environments (where possible) and ensure housing is close to green spaces.

Professor
Monique Simmonds

Deputy Director of Science at the Royal Botanic Gardens, Kew, UK.

Monique Simmonds OBE is a professor of biological interaction. She has over 30 years' experience working in the field of plant-animal interactions and specialises in the chemistry of medicinal plants.

Plants and plant-derived molecules can be the cause as well as the remedy for allergic reactions.

Lipid transfer proteins (LTPs), for example, occur in a wide range of fruit, vegetables, nuts and cereals and while designed to protect the plant, they can cause severe allergic reactions in people.

They can also trigger allergic cross-reactivity - where someone develops a food allergy to a specific group of plant, but then finds themselves allergic to other food plants. This could be because these plants contain the same or related allergens to those that caused the first allergic response. For example, a group of proteins in plants called Gibberellin-regulated proteins (GRPs) are associated with multiple fruit allergies.

To prevent these allergies plant breeders could decrease the levels of these proteins in plants.

Further studies are needed to assess how successful this approach could be. In addition, diagnostic kits to test for these proteins in foods could provide some reassurance to people with allergies.

Another area of concern is the increased use of synthetic essential oils added to many fragrances that can cause respiratory reactions.

However, although some plants in our diet or in nature can cause allergies, the majority do not. Indeed, communities worldwide use plants to treat allergies, although evidence of their effectiveness is limited. In contrast, there is an increasing body of evidence that some species of trees can help decrease allergies associated with air pollutants such as particulate matter by absorbing the pollutants.

Next steps

We need a better understanding of the molecular properties of plants that elicit allergic reactions so we can manage allergies better.

Professor
Miriam Moffatt

Professor of Respiratory Genetics at the National Heart and Lung Institute, Imperial College London, UK.

For more than 30 years, Professor Moffatt has worked in the field of human complex disease genetics and genomics with a particular focus on asthma and atopic dermatitis (eczema). She and her long-term research partner, Professor Bill Cookson, were the first to find that normal healthy lungs have a characteristic microbiome that undergoes changes (dysbiosis) in asthma and chronic obstructive pulmonary disease. Following this breakthrough finding, they have carried out studies to characterise the lung microbiome in a number of respiratory conditions.

Genes, bacteria and viruses are important components underpinning allergic disease. We know, for example, that certain genes such as ORMDL3 are closely associated with asthma.

Many of the asthma and allergy-associated genes are found in the respiratory epithelium - the layer of cells that line the lungs and form a barrier between the body and the outside environment.

The epithelium also triggers the immune system into action when it encounters an allergen to which it is sensitised. The lung microbiome - the micro-organisms including bacteria that live in the respiratory tract - is now also understood to play an important role in both health and lung disease.

Research has shown that healthy lungs have a characteristic microbiome that is altered by disease - so called dysbiosis. For example, asthmatics (be they mild, moderate or severe) have a loss of diversity in their lung microbiome. Smoking has a similar impact on the diversity of the respiratory microbiome.

Meanwhile, respiratory viruses (for example, those that cause the common cold) can cause a worsening of symptoms in many lung conditions including asthma. Research suggests that this is because the viruses trigger changes in the lung microbiome.

Next steps

We now need more detailed research into how we interact with our lung microbiome, as well as understanding the changes that occur in these interactions because of exposure to viruses, inhaled allergens and different lung conditions.

For those suffering food allergies/ anaphylaxis, research to date has been focused on the gut microbiome and characterisation of the lung microbiome has been lacking but is required. In the future, it may be possible to treat allergies and lung conditions by rebalancing the lung microbiome.

Professor
Deborah A Meyers

Professor of Medicine Co-Chief, Division of Genetics, Genomics and Precision Medicine, UA Department of Medicine
Co-Director, Division of Pharmacogenomics, UA Center for Applied Genetics and Genomic Medicine

Professor Meyers' current scientific interests and expertise are in translational approaches in genetics and genomics, including both allergic and non-allergic asthma where she has worked extensively on the genetics of disease susceptibility and severity, and pharmacogenetics of responsiveness to therapy. She has published over 360 manuscripts, 70 book chapters, editorials, and reviews, as well as over 400 scientific abstracts.

Too often in healthcare there's a one-size-fits-all approach. However, in reality, treatments for the 'average' patient may not work for an individual.

Understanding the genetic differences between people of differing ancestry is imperative for understanding how disease including allergies affect different groups of people.

For example, a U.S. study published in 2019 in the New England Journal of Medicine found that almost half of young African American children with poorly controlled asthma responded differently to asthma medication than older black children and adults.

Genetic differences may also determine how susceptible someone is to allergic disease, even severe anaphylactic reactions, how and whether the disease will progress and how it should best be treated.

Investigating the relationship between genetics and the environment is also important because people will have different exposures to allergens depending on where they live and their lifestyle - across the world, there are strong links between races and ethnic groups and lifestyle including housing, access to healthcare and local environment. Unfortunately, the majority of genetic studies has involved patients of white European ancestry.

Next steps

New approaches to address the lack of diversity in clinical trials are underway.

For example, in the United States, the All of Us study is recruiting more than a million individuals who are not usually represented in clinical studies.

This will give scientists the opportunity to better address racial and ethnic differences. Studies in the UK and around the world must adopt a similar approach.

Professor
Erika von Mutius

Director of the Institute of Asthma and Allergy Prevention at Helmholtz Centre, Munich, Germany.

As a senior physician and professor of paediatric allergology at the University of Munich, Erika von Mutius headed the Department of Asthma and Allergy at the Dr. von Hauner Children's Hospital from 1993 until September 2023. Since 2017, she has been heading the Institute of Asthma and Allergy Prevention (IAP) at Helmholtz Munich and was appointed Department Head of the Environmental Health Center at Helmholtz Munich in 2021. Her research focuses on the underlying mechanisms of childhood asthma and allergies with the aim of ultimately preventing these diseases in children at risk.

Children growing up on traditional, family-run farms are much less likely to develop asthma, hayfever and food allergies, than those living elsewhere.

Repeated studies from around the world have shown this also to be true for children raised in traditional rural environments such as Russian Karelia, and in rural China and Africa.

The protective effect is attributed to exposure to beneficial bacteria and fungi in the early years of life which are abundant in such environments. Bacteria found in cow sheds and unprocessed raw cow's milk create a diverse microbiome in the respiratory tract and the gut which in turn trains the immune system not to react to allergens such as pollen, animal dander, house dust or foods.

Spending just 20 minutes a day in a cow shed in the early years of life was associated in my study with more than an 80% lower risk of allergies.

Similar training of the immune system can also be achieved in people with asthma and hay fever by administering fragments of dead bacteria called bacterial lysates to the upper respiratory tract - a type of allergy immunotherapy. Studies show this approach reduces the frequency of wheeze by about 50%, asthma attacks and hay fever symptoms.

Next steps

We now need to identify the precise compounds that provide protection from allergies.

It's most likely to be a cocktail of compounds, rather than one magic ingredient. In the future, it could mean using a nasal spray or taking a tablet containing such a cocktail to prevent and treat allergies.

Professor
Gary Wong

Professor of Paediatrics at The Chinese University of Hong Kong.

Gary Wong is a professor at the Chinese University of Hong Kong. He has 25 years' experience working in the field of allergies, during which he has conducted epidemiological studies aimed at identifying the factors in the rural environment that protect against asthma and allergies.

Half a century ago, asthma was an uncommon disease in many Asian cities.

However, as they have become more Westernised, the prevalence of asthma in Hong Kong, Singapore, and Tokyo has caught up with the West in just a few decades. Yet in genetically similar Chinese communities living in other locations, the risk of developing asthma is totally different.

When we compared children from Hong Kong with those living in cities in mainland China 20 years ago, we found that asthma was almost 3 times higher in children from Hong Kong compared with those in Guangzhou or Beijing. However, over the following 2 decades, there was a rapid increase in asthma prevalence in mainland Chinese cities as they developed, while in rural Chinese villages the prevalence of asthma and allergies remained low.

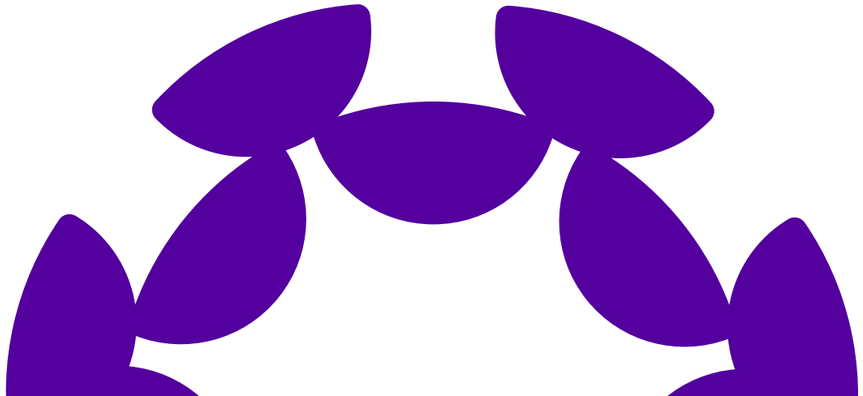
Exposure to domestic poultry is thought to be the main factor responsible for the protective effect against allergies in rural China.

Further studies of children from rural China showed they had a dampened immune system compared to their urban counterparts, putting them at lower risk of allergies. Dust from these rural environments has also been shown to reduce inflammation of the airways in mice with asthma.

Next steps

The key components in the dust driving this protection are yet to be identified.

A clear understanding of the underlying biological mechanisms which will explain how these components modify the early immune system and protect against asthma and allergies is crucial for the development of prevention strategies against asthma and related allergies.



Professor
Donata Vercelli

Regents Professor of Cellular and Molecular Medicine at the University of Arizona, Tucson, Arizona, U.S.

Donata Vercelli has over 30 years' experience in the field of allergy, and specialises in the study of the mechanisms in environments rich in microbes that protect against allergies and asthma. In 2019 she was awarded the Rebecca Buckley Lectureship from the American Academy of Allergy, Asthma and Immunology. She is an elected member of the Association of American Physicians (AAP) and an elected Fellow of the American Association for the Advancement of Science (AAAS).

Asthma and allergies often begin in early life; by the time disease is diagnosed, irreversible changes to the airways have already occurred. Preventing allergic disease is therefore one of the Holy Grail's in medicine, but to date effective solutions remain elusive.

The finding that children raised on traditional Amish farms are strongly protected from asthma and allergy compared to non-farm children may lead to novel preventive strategies. The 'farm effect' observed in rural Europe was largely attributed to the child's early exposure to microbes carried by farm animals, especially cows.

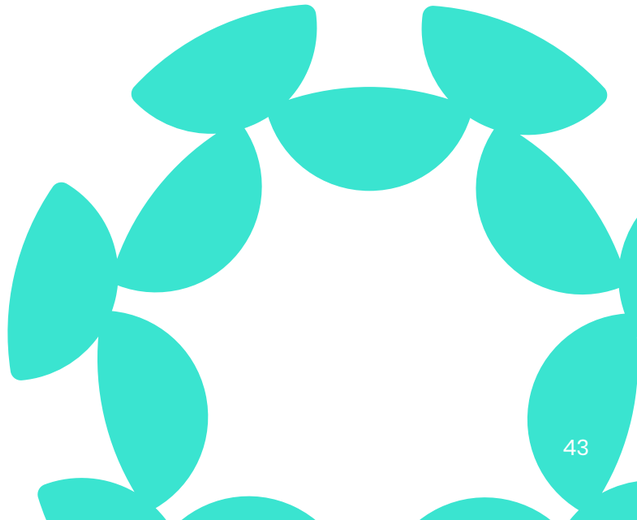
Farming practices and exposure to vegetation also appear to offer protection. It's thought that exposure to a rich variety of microbes strengthens and matures the innate immune system - the defences we are born with - preventing the body from over-reacting when it comes into contact with an allergen.

New research I was involved with tried to identify the protective proteins in Amish cowshed dust. Twelve animal and plant proteins loaded with microbial products were identified - including some from cows - and giving this dust to mice through the airways, was sufficient to protect these animals from allergic asthma.

Next steps

The finding that components of cowshed dust offer protection against allergic asthma, published in the Journal of Allergy and Clinical Immunology in 2023, could provide vital clues on how to prevent allergies.

We can't give a cow to every child at risk of allergy to give them protection, but we can provide safe microbial products that mimic the protective effects of natural microbe-rich environments against both allergy and viral respiratory infections - the 2 main components of asthma.



Professor
Cathy Thornton

Professor of Human Immunology at Swansea University, Wales, UK.

With nearly 30 years' research experience, Cathy Thornton is internationally recognised for her expertise in the early life origins of immune disease. Her research focuses on the differences in immune function at birth and how this can have adverse outcomes on child health. She is also investigating how the perinatal environment, linked to climate change, affects the programming of foetal organs and the consequences of this for child health. This includes leading a UK-wide consortium as part of the Clean Air Programme.

We now know that the origins of allergic disease and asthma can be traced back to early life - including even before we are born.

Exposure to a variety of factors in the womb and early childhood can influence the programming of our organs and the immune system, making the development of allergy and asthma (and other inflammatory diseases such as inflammatory bowel and autoimmune diseases) more likely. These include tobacco smoke, air pollution, whether a mother has allergies herself and her microbiome.

Conversely, exposure to a rich variety of microbes found in farm barns in the early years of life has been shown to offer a protective effect against allergies. However, we still need a better understanding of the development of the immune system in the foetus and newborns and the factors that influence it.

Greater understanding of these mechanisms at key stages of a child's development could lead to new ways of preventing and treating allergic disease. It could even lead to a better understanding of the rare but potentially fatal extreme allergic reaction, anaphylaxis.

We don't yet know who is susceptible to this condition and how can it be treated and prevented, although there is likely to be a genetic component.

Next steps

Identifying better predictive biomarkers for allergic disease is key and a database of patients with anaphylaxis to use in research would be very useful for uncovering new insights into this devastating condition.

Professor
Gideon Lack

Professor of Paediatric Allergy, King's College London, UK.

Professor Lack's research focuses on the prevalence of food allergies in children and the relationship between food allergies, eczema, and asthma. He works on novel immune-modulatory treatments for food allergies and on developing new strategies to prevent the development of allergies and asthma in children and adults. He is also Head of the Children's Allergy Clinical Academic Group at King's Health Partners Institute of Women and Children's Health at Evelina London, Guy's & St. Thomas' NHS Foundation Trust.

Between 6 and 8% of UK schoolchildren will develop life-threatening food allergies, and up to 16,000 newborns develop a peanut allergy every year. Yet many food allergies including egg are preventable.

There is now strong scientific evidence that regular consumption of peanuts from aged 4 to 6 months until the age of 5 will prevent more than 80% of new cases of peanut allergy.

Most other food allergies including egg - one of the most common food allergies in children - can also be prevented by regularly eating food allergens during this key period of 4 to 6 months of age.

The evidence shows by consuming these food allergens at this age on a regular basis, it trains the immune system to tolerate these foods rather than to reject them.

Next steps

We now need to refine this knowledge further, ideally with a randomized controlled trial to work out the optimal timing and dosage of peanut protein an infant should consume to prevent a peanut allergy.

Weaning guidelines should now state that infants eat the equivalent of at least 2 teaspoons of peanut butter and 1 whole egg per week by 6 months of age (in higher-risk infants by 4 months).

Such guidelines, backed by advice and support from healthcare professionals, will significantly reduce the burden of food allergies.

Professor
James Gern

Professor of Paediatrics and Medicine at the University of Wisconsin, U.S.

James Gern has 35 years' experience working in the field of paediatric allergy and clinical immunology. His research focuses on identifying how viral respiratory infections and other environmental and individual factors influence the development of childhood asthma and exacerbations of the disease. He is an expert on rhinoviruses and the way respiratory viruses, airway bacteria and allergies interact.

Viral respiratory infections are the most common cause of wheezing illnesses in preschool children, and a major source of exacerbations of asthma in children and adults.

The same respiratory viruses cause common colds which, for many, have only mild symptoms. This suggests that additional personal or environmental factors determine whether a viral infection will cause a common cold or a more significant respiratory illness with wheezing.

To investigate this, we analysed the genes and bacteria found in the epithelium of the airways - the lining which acts as an interface between the body and the environment. This showed that people who develop allergic inflammation in the airways when they come into contact with a respiratory virus, also have reduced immune responses to protect the body from viruses or bacteria.

Tobacco smoke, other air pollutants, allergens, bacteria in the airways and the specific virus type can also influence the severity of a viral infection.

Next steps

A greater understanding of what makes a healthy respiratory, skin or gut microbiome could lead to new treatments to prevent and treat allergic disease.

This could include lifestyle changes or taking prebiotics or probiotics to improve the health of the body's microbiome. For example, could increasing the exposure of pre-school children to pets, farm settings, or outdoor environments help prevent allergies and asthma?

Discovering the genetic and environmental factors that change the way the epithelium responds to allergens, microbes and irritants is also critical to understanding the development and progression of allergic disease and asthma.

Professor
Michael Depledge CBE, Emeritus

Professor of Environment and Human Health at the University of Exeter and Special Scientific Advisor of the Eden Project, Cornwall, UK.

Michael Depledge has conducted both medical and ecotoxicological research at leading institutions around the world for 50 years. His work has addressed diverse topics ranging from tackling respiratory problems that arose during the first bone marrow transplants in Europe for the treatment of leukaemia, to the detection of chemical pollution and its effects, and studies of the use of the natural environment to foster improvements in human health and wellbeing. He has been an advisor on environment and health issues to the UK Government, the World Health Organisation, the United Nations Environment Programme, the European Environment Agency among others.

As the incidence of allergies continues to rise, the role that environmental chemicals may play in exacerbating allergic reactions is attracting increasing attention.

Research shows that exposure to contaminants including heavy metals, pesticides, a wide range of volatile organic compounds, pharmaceuticals, micro-plastics and nanomaterials may be implicated. Since 1950, the global production of chemicals has risen more than 50-fold, and is expected to triple again by 2030, exposing humans across their lifetime to a wide variety of chemical mixtures in low concentrations.

The interaction between environmental chemicals and allergens is complex. Indeed, research into the 'body burden' of chemicals that we gradually accumulate during our lives and how it influences an individual's susceptibility to allergy is still in its infancy. A greater understanding of its impact offers hope of devising protective measures.

Currently over 56% of the global population live in urban environments where exposure to pollutants, especially air pollutants, is highest – a figure that is expected to increase to 70% by 2050.

Where 'allergy hotspots' associated with chemical pollution are likely to occur is difficult to predict due to the changing climate, as well as the reshaping of demographics and human behaviour, but will be key to managing allergy in the future.

Next steps

We now need to quantify and map the occurrence of allergies, nationally and internationally, in relation to both acute and long-term exposure to environmental chemicals and their body burdens on the population.

Professor
Jonathan Grigg

Professor of Paediatric Respiratory and Environmental Medicine, at Queen Mary University of London, UK.

Jonathan Grigg's current research focuses on the effects of air pollution on airway infection, and the fate of inhaled particulate matter in patients. He was a member of the UK Department of Health's Committee on the Medical Effects of Air Pollution, and Chair of the European Respiratory Society's Tobacco Control Committee. He has authored reports from the Royal College of Paediatrics and Child Health (UK) on the health effects of indoor and outdoor air pollution.

There is clear scientific evidence that exposure of young children to traffic pollution increases the risk of developing asthma - and if they already have asthma, it makes the symptoms worse.

Furthermore, recent studies suggest that air pollution also increases the risk of children becoming sensitised to food allergens and eczema. The highly influential Oxford Street study, where asthmatic adults walked up and down Oxford Street, showed that short-term exposure to traffic-related air pollution (TRAP) lowered lung function - potentially a significant problem for both children and adults with asthma.

A New Zealand study found long-term exposure to TRAP increased the risk of asthma deaths in children and adults, and in China, short-term exposure to TRAP was associated with adult deaths from asthma.

The key pollutants are inhalable particulate matter (PM), and nitrogen dioxide (NO_2). PM less than 10 microns in diameter (PM_{10}) is of greatest concern because it can both remain in lung tissue for long periods and can move around the body, for example, in pregnant women from the lung to the placenta.

In urban areas, vehicle emissions, boilers, wood burners and commercial cooking contribute to PM and families living in deprived areas of cities are disproportionately exposed to TRAP, contributing to health inequalities.

Next steps

Reducing traffic-related air pollution is vital for reducing allergic disease.

There may also be other ways of mitigating the risk – by rebalancing the immune system using oral extracts of bacteria, but more research is needed.

Professor
Adnan Custovic

Professor of Paediatric Allergy at the National Heart and Lung Institute, Imperial College, London, UK.

After gaining a professorship at the University of Manchester, Adnan Custovic moved to Imperial College in 2015. In 2013 he received the BSACI William Frankland Medal for outstanding contributions to clinical allergy in the UK and in 2015, he was awarded ERS Gold Medal for research in asthma. He has published more than 400 papers in peer-reviewed journals and serves on the board of directors of the World Allergy Organisation. He served as a Secretary of the BSACI for 2 terms, and as President of Asthma section of the EAACI.

Clinically, allergic disease presents in many different ways; some patients have symptoms affecting a single organ, while others have symptoms of varying severity affecting several different organs.

Precisely how allergic disease develops is largely unknown, although one pattern is known as atopic march. With this, patients start with eczema in infancy, progress to wheezing and asthma and then in later childhood develop rhinitis.

However, there are wide variations in the order in which these symptoms develop. Understanding how and why allergies develop is important as early diagnosis and appropriate management of those at risk may help reduce progression of allergic disease and severity of these diseases into adulthood. However, processing, analysing and interpreting the large quantities of data required can be challenging.

Next steps

Machine learning (ML) or artificial intelligence (AI) may offer a new potential solution. These modern data analysis techniques can digest large amounts of data quickly and identify hidden patterns that humans cannot find.

These hidden patterns may offer scientists important clues about what is causing the progression of allergic disease - theories that must then be verified by research.

ML modelling so far has suggested that most children with early-life eczema do not develop wheeze and/or rhinitis, in fact, most 2 allergy-related disease combinations occur by chance. However, these results are only as good as the data used by algorithms - and we know that many data sets used in allergy research are racially imbalanced.

This needs to be addressed as it is critically important to understand how patterns of allergic disease vary in different ethnic groups.

Professor
Hasan Arshad

Professor of Allergy and Clinical Immunology at the University of Southampton, UK.

Professor Arshad heads the Asthma, Allergy and Clinical Immunology department at University Hospital Southampton and leads allergy research at University of Southampton. His research has focused on identifying novel biomarkers in early life for predicting asthma and lung function deficit, and strategies for prevention of childhood asthma using allergen avoidance and allergen immunotherapy. He has contributed to both U.S. and European guidelines for food allergy management and prevention of asthma and food allergy. He has published around 300 peer reviewed papers and was awarded the prestigious Jack Pepys award by the British Society of Allergy & Clinical Immunology.

Asthma poses a huge and unacceptable burden on individuals, the NHS and society. Finding a way to prevent the condition would therefore be a colossal success of modern medicine, saving and improving the lives of hundreds of millions worldwide.

A number of strategies have been tried - and failed; allergen avoidance, vitamin D, omega-3 fatty acids, probiotics, antihistamines, inhaled steroids and vaccines. However, an increasing body of evidence suggests that exposure to a high dose of allergens early in life can make the immune system more tolerant to allergens - so called allergen immunotherapy (AIT).

This approach is now established for certain food allergies, but the question is could it hold promise for preventing allergic asthma too?

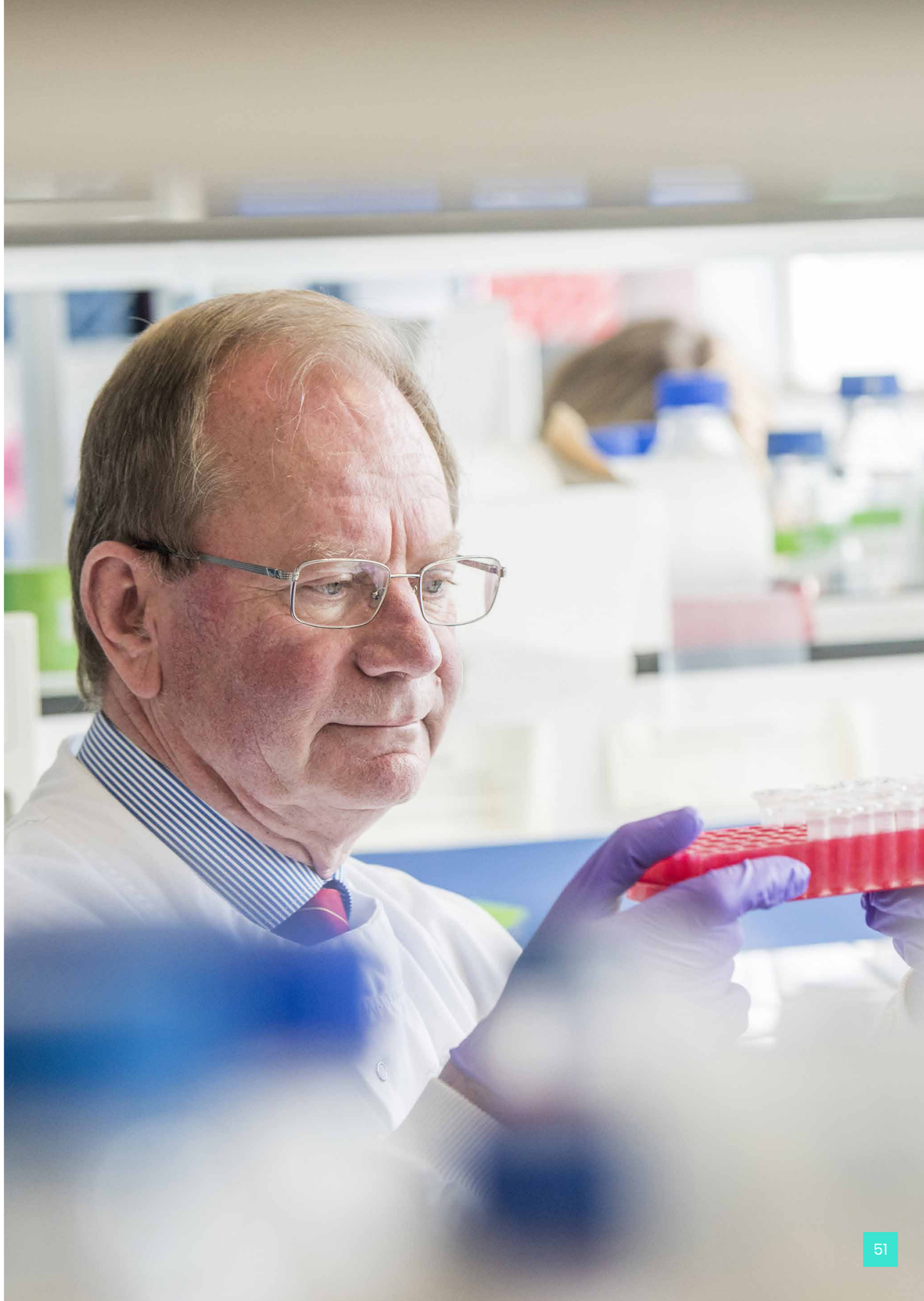
We conducted the first proof of concept, randomised, double-blind, placebo-controlled trial of AIT using house dust mites (HDM) to see if they could prevent children becoming sensitised to allergens and asthma developing. We enrolled 111 infants aged 5-9 months with 2 or more immediate family members with allergy. HDM extract or placebo were given orally twice daily for a year, and the children were monitored for another 5 years.

Results showed HDM was safe and children taking the HDM extract were less sensitive to allergens throughout the follow-up period. Furthermore, just 2.9% had asthma at aged 6 compared with 16.8% who had taken the placebo extract.

Next steps

Larger studies are now needed into the use of allergen immunotherapy to prevent both asthma and food allergies in high risk children.

If successful, they could have significant public health implications for reducing allergic disease.



The work of Natasha's Foundation

Natasha's Foundation was started by Tanya and Nadim Ednan-Laperouse OBEs after their daughter, Natasha, died aged 15 from a severe allergic reaction to sesame.

Natasha ate a baguette containing hidden sesame seeds. They were not visible and were not listed as an ingredient on the packaging.

Had they been, she would be alive today. Natasha's death in 2016 was preventable.

First launched in 2019 as The Natasha Allergy Research Foundation, Natasha's Foundation has expanded ever since.

Through campaigning, education and research, the Foundation's mission is to create a future without food allergy. It is dedicated to improving the lives of the millions of people with food allergy and their loved ones, as well as supporting families bereaved by food allergy tragedies.

Tanya and Nadim were both awarded OBEs in 2022 in recognition of their services to charity and for people with allergic disease.

Starting with food allergy, Natasha's Foundation wants to create a world that is safe for everyone.

> *"We are determined that other families never have to bear the terrible grief we will always carry."*
>
> **Tanya and Nadim Ednan-Laperouse OBEs,** founders of Natasha's Foundation.

Our journey

At Natasha's inquest in 2018, the coroner stated that if there had been proper allergen information on the baguette that Natasha consumed, she would never have eaten it.

During the inquest, Tanya and Nadim were made aware of a shocking and dangerous legal loophole which meant, at the time, there was zero obligation for suppliers to comprehensively list the ingredients on pre-packaged foods made and sold on the same premises.

Following tireless campaigning to close this loophole, Natasha's Law was introduced in October 2021.

This regulation requires all pre-packaged foods made on the premises for direct sale to display a full ingredients list, with the top 14 allergens clearly highlighted.

This game-changing legislation will not only prevent further tragedies but has transformed everyday life for people with food allergy in the UK.

However, Natasha's Law was just the start.

Our impact

Since the Foundation launched just 7 years ago, Natasha's Foundation has had an enormous and profound impact.

Natasha's Law

Natasha's Law came into force across the UK on 1 October, 2021. It requires all food retailers to display full ingredient and allergen labelling on every food item made on the premises and pre-packed for direct sale, such as sandwiches and salads.

Natasha Medical Bursaries

The Foundation has so far funded 112 bursaries to students through Southampton University since 2020, to help create the next generation of allergy specialists.

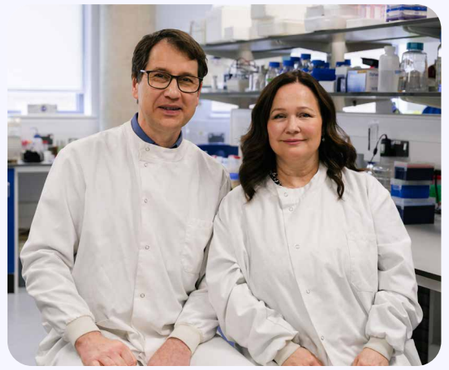
This major scheme will help plug the critical skills and training gaps in allergy medicine, with the UK in need of at least 44% more consultant immunologists.[25]

Global Allergy Symposium

Hosted by HRH The King, then the Prince of Wales, this landmark summit in September 2022 brought 16 world-leading allergy experts together to share research and develop a blueprint for eradicating allergies.

The Natasha Clinical Trial

In 2022, the Foundation announced the launch of a major £2.7 million clinical oral immunotherapy trial. Up to 300 children and young people aged 2 to 23 with milk and peanut allergies are taking part across 9 NHS centres.



Led by researchers at the University of Southampton, University Hospital Southampton and Imperial College London, the trial aims to prove that everyday foods - taken under medical supervision - can be an effective and low-cost NHS treatment for those with food allergies. The full results will be released in 2027.

Allergy School

Natasha's Foundation launched Allergy School, a £1 million programme delivering high-quality food allergy training and resources to schools and other educational settings free of charge, in February 2025.

In its first year, to February 2026, more than 22,000 people engaged with Allergy School.

Natasha's Prize

Natasha's Prize is Natasha's Foundation's next flagship initiative — an ambitious and bold global research Prize designed to help deliver our mission of creating a future without food allergy.

25. Royal College of Pathologists 2025 (RCPath Clinical-immunology-workforce-report-2025.pdf)

We need you to help us find solutions to create a future without food allergy.

Do you think you know how we might prevent food allergy developing in the first 1,000 days, from conception to age 2?

If you think you do, we invite you to apply for Natasha's Prize

This £10 million global allergy research Prize is the largest ever investment in food allergy research in the UK, and a once-in-a-generation opportunity to create a future without food allergy.

Applications close on Friday 3 July 2026.

Together, we will find, fund and power the most revolutionary and groundbreaking solutions to the food allergy epidemic

APPLY HERE for Natasha's Prize >>

Natasha's Foundation

A future without food allergy

For more information

natashasprize.org.uk

prize@natashasfoundation.org.uk

natashasfoundation