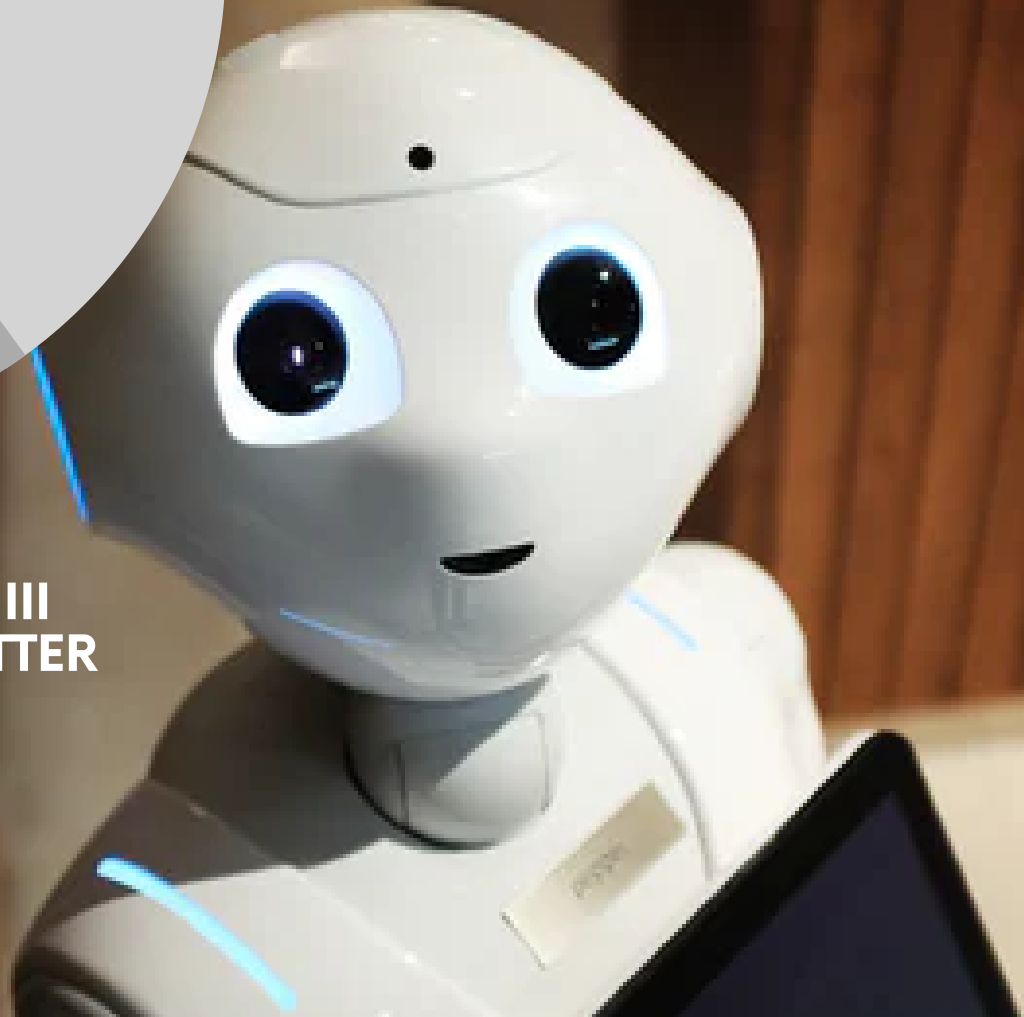




**VOL: II ISSUE: III  
URC E-NEWSLETTER  
MARCH 2022**



## RESEARCH @

### In this issue:

- Funding opportunities such research grants, early career grants, awards, and fellowships
- Publication supporting fund
- Workshop on Grant writing and Management
- Peradeniya University Research Showcase Event 2022
- Multidisciplinary research scheme
- RESPIRONE NANO AV 99 FACE MASK
- Randomized Controlled Trials in the Social Sciences

**UNIVERSITY RESEARCH COUNCIL –  
UNIVERSITY OF PERADENIYA**

# Grants

## Alain Bensoussan fellowships

The European Research Consortium for Informatics and Mathematics invites applications for the Alain Bensoussan fellowship programme. This enables early-career scientists to conduct research at leading European centres outside their own country. Research must align with the following topics: computer applications, computer systems organisation, computing methodologies, computing milieux, data, hardware, information systems, mathematics, mathematics of computing, software, theory of computation and other related disciplines.

Applicants must have obtained a PhD during the last eight years, or be in the last year of their thesis work, although the PhD degree must be completed before the start of the fellowship programme.

Closing date 30 April 2022

Award amount max €46,800

Award amount min €24,840

Country of applicant institution Any

Website: <https://fellowship.ercim.eu/information>

## Mentored research awards

The International Anaesthesia Research Society invites applications for its mentored research awards. These support clinical, translational or basic science that is relevant to the broad practice of anaesthesiology and its subspecialties. The aim is to support investigations that will further the understanding of clinical practice in anaesthesiology and related sciences. Grants are intended to help create future leaders and prepare applicants to apply for independent research funding.

Principal applicants must be members of the society who have yet to establish substantial independent research funding or who are initiating a new area of research.

Closing date 30 April 2022

Award amount max USD 175,000

Country of applicant institution Any

Website: <http://iars.org/iars-mentored-research-award/>

# Ramsay grant

The Solve ME/CFS Initiative invites applications for the Ramsay awards. These support research on myalgic encephalomyelitis, chronic fatigue syndrome (ME/CFS) and long-covid. The programme particularly aims to support studies with a particular emphasis on engaging young investigators and researchers new to the field.

Researchers may form a collaboration across two or more laboratories based out of different institutions.

The following grant types are available:

- lab-based research grants, ranging from USD 35,000 to USD 55,000 each for one year, with the possibility of renewal;
- data-only grants, which support studies that will analyse the data in the You + ME registry, worth up to USD 10,000 each for six months, with the possibility of renewal.

Closing date 30 April 2022 (forecast)

Award amount max USD 55,000

Award amount min USD 35,000

Country of applicant institution Any

Website: <https://solvecfs.org/research-and-registry/ramsay-research-grants/applying-for-a-grant/>

# Research awards for driving global impact

Nature invites applications for its research awards for driving global impact. These recognise early-career researchers who are addressing global challenges. Applications are invited from researchers working in one or more of the following areas:

- food security, water security or energy security – ensuring a long term, sustainable supply of either food, water or energy;
- healthcare interventions – the assessment, improvement or promotion of human health;
- environmental protection – protection of the natural environment on land and water, including the repair of damage;
- climate change – slowing climate change and adapting to what's unavoidable;
- sustainable cities – building green, liveable cities that last.

Applicants must be employed by a university, research institute or other non-profit organisation. They must hold a PhD or clinical doctorate awarded no earlier than 1 January 2006

Closing date 30 April 2022 (forecast)

Award amount max USD 30,000

Award amount min USD 10,000

Country of applicant institution Any

Website: <https://www.nature.com/collections/ccjnyjxvmp/about>

## Working group proposals

The International Science Council, under its Scientific Committee on Oceanic Research, invites proposals for its working groups call. This supports the organisation of working groups on topics relevant to oceanic research.

Two grants worth up to USD 45,000 each are available for a period of three to four years.

Closing date 30 April 2022 (forecast)

Award amount max USD 45,000

Country of applicant institution Any

Website: <https://scor-int.org/work/groups/proposals/>

# Pilot grant programme

The Lung Cancer Research Foundation invites letters of intent for its pilot grant programme. This provides funding for research focused on the prevention, diagnosis, treatment and cure of lung cancer. All innovative projects across the spectrum of basic, translational and clinical research will be considered. Projects must address one or more of the following topics:

- lung cancer biology;
- prevention and screening for early detection;
- identification of new biomarkers;
- development of more effective and less toxic therapies;
- mechanisms of sensitivity and resistance to lung cancer therapies;
- supportive measures for people with lung cancer and their families;
- quality of care and outcomes research.

Closing date 30 April 2022 (forecast)

Award amount max USD 150,000

Country of applicant institution Any

Website: <https://www.lungcancerresearchfoundation.org/research/funding-opportunities-2022/>

## SHAPES – call 2

The Smart and Healthy Ageing through People Engaging in Support Systems invites applications for its call. This aims to extend the capabilities and functionalities of the SHAPES platform, with new types of medical devices and digital solutions, also including internet of things platforms built for e-health applications.

Closing date 30 April 2022

Award amount max €50,000

Country of applicant institution Any

Website: <https://shapes2020.eu/open-calls/call-2/>

# Tinnitus research grants

The American Tinnitus Association invites application for its tinnitus research grants. These support multidisciplinary research solving the complex and variable experience within tinnitus research, clinical care, and patient outcomes.

Closing date 01 May 2022

Award amount max USD 250,000

Country of applicant institution Any

Website: <https://www.ata.org/research-toward-cure/research-program/apply-grant>

## **Fellowships** **Alain Bensoussan fellowships**

The European Research Consortium for Informatics and Mathematics invites applications for the Alain Bensoussan fellowship programme. This enables early-career scientists to conduct research at leading European centres outside their own country. Research must align with the following topics: computer applications, computer systems organisation, computing methodologies, computing milieux, data, hardware, information systems, mathematics, mathematics of computing, software, theory of computation and other related disciplines.

Applicants must have obtained a PhD during the last eight years, or be in the last year of their thesis work, although the PhD degree must be completed before the start of the fellowship programme.

Closing date 30 April 2022

Award amount max €46,800

Award amount min €24,840

Country of applicant institution Any

Website: <https://fellowship.ercim.eu/information>

RESEARCH @ University Research Council – University of Peradeniya

# Postdoctoral fellowships

The European Institute for Marine Studies, in partnership with the Interdisciplinary School for the Blue Planet (ISblue), invites applications for its postdoctoral fellowships. These support young marine scientists in developing their own research at one of the ISblue laboratories in France.

Applicants must have obtained their doctoral degree within the last four years and have spent a minimum of 18 months outside of France between 1 May 2017 and the start of the project. Candidates with a French doctoral degree will only be considered if they have extensive international experience.

Closing date 30 April 2022 (Forecast)

Award amount max €84,400

Award amount min €37,200

Country of applicant institution Any

Website: <https://www.labexmer.eu/en/international/postdoctoral-fellowships>

## Hunt postdoctoral fellowships

The Wenner-Gren Foundation for Anthropological Research invites applications for the Hunt postdoctoral fellowships. These support early-career investigators with the writing-up of already completed research in anthropology. The research should demonstrate a clear link to anthropological theory and debates and promise to make a solid contribution to advancing these ideas. Proposals that employ a comparative perspective, generate innovative approaches or ideas or integrate two or more sub-fields are particularly welcomed.

Applicants should be scholars who have held their PhD for no longer than 10 years. There are no restrictions on institutional affiliation, country of residence or nationality.

Closing date 01 May 2022

Award amount max USD 40,000

Country of applicant institution Any

Website: <http://www.wennergren.org/programs/hunt-postdoctoral-fellowships-writing>

# Discovery fellowship

The Biotechnology and Biological Sciences Research Council invites applications for its discovery fellowship. This enables researchers to gain leadership skills by undertaking independent research in any area of science within the council's remit, which includes research on plants, microbes, animals, and tools and technology underpinning biological research.

Applicants should have a PhD, or be expecting to have passed their viva prior to 30 November 2022. Overseas researchers may apply but the host institution must be a UK-based university

Closing date 05 May 2022

Award amount max £500,000

Country of applicant institution Any

Website: <https://www.ukri.org/opportunity/bbsrc-discovery-fellowships-2022/>

# Research fellowships

The Myositis Association invites applications for its research fellowships. These support young physicians and postdoctoral investigators beginning a career in myositis research.

Early-stage clinical or basic investigators may apply. Applicants should have completed residency training or have received their PhD within three years prior to commencing the fellowship and be performing research under the supervision of an established mentor at an accredited medical school, university or research institute.

Closing date 15 May 2022 (Forecast)

Award amount max USD 100,000

Country of applicant institution Any

Website: <https://www.myositis.org/research/tma-grants-fellowships/research-funding-opportunities/>



# Research fellowships

The European Society for Medical Oncology invites applications for its research fellowships. These support high-quality research projects in either translational or clinical research. Fellowships may be in the following areas:

- translational – aiming to provide training in translational cancer research in European centres and improve career development through collaboration;
- clinical – aiming to provide training in clinical research in European cancer centres, as well as to support the development of clinical oncology research projects.

Applicants must be members of the society and under the age of 40. They must also be oncologists with at least one year of experience in medical, radiation or surgical oncology and currently engaged in cancer research or clinical oncology practice and be proficient in English.

Closing date 15 May 2022

Award amount max €81,000

Country of applicant institution Any

Website:<https://www.esmo.org/career-development/oncology-fellowships/fellowship-offers/esmo-research>

## Audrey S Bingel fellowship for female scientists

The American Society of Pharmacognosy invites applications for the Audrey S Bingel fellowship for female scientists. This supports a female scientist in transitioning from a current career track to another to to bolster the likelihood of success in the current preferred career path.

Applicants must have been members of the society for at least three years.

Closing date 15 May 2022

Award amount max USD 25,000

Country of applicant institution Any

Website: <http://www.pharmacognosy.us/grants-and-awards/audrey-s-bingel-fellowship-for-female-scientists/>

# Lilburn research fellowship

The Lilburn Trust invites applications for the Lilburn research fellowship. This supports scholarly research leading to publication on aspects of New Zealand and music. Recipients will have access to the resources of the Archive of New Zealand Music and the wider published and unpublished collections of the Alexander Turnbull Library.

The fellowship is open to persons resident in New Zealand or overseas. Applicants need not possess a university degree or diploma, but must demonstrate strong research skills that lead to publication in scholarly or popular form.

Closing date 17 May 2022 (Forecast)

Award amount max NZD 70,000

Country of applicant institution Any

Website: [http://www.douglaslilburn.org/lilburn\\_research\\_fellowship.html](http://www.douglaslilburn.org/lilburn_research_fellowship.html)

## AXA postdoctoral fellowship

The AXA Research Fund invites applications for its funding for postdoctoral fellowship focused on preventing long-term exposure to harmful substances and mitigating its impacts. This supports postdoctoral research on the impact of harmful substances on human health, as well as the role of public health policy and the costs for the economy and the insurance business. Specifically, projects should look into the human health impact of pollution, arsenic, asbestos, benzene, cadmium, dioxin, fluoride, lead, mercury, and hazardous pesticides, and involve perspectives from the fields of climate, environment, health and socio-economics.

Applications are invited from early-career researchers, no more than five years past the completion of their PhD, who are affiliated with academic institutions.

Closing date 20 May 2022 (Forecast)

Award amount max €125,000

Country of applicant institution Any

Website: <https://www.axa-research.org/en/page/AXA-Fellowships>

# Publication supporting fund



## Research Publication Facilitation Fund [RPFF] University of Peradeniya

The University Research Council [URC] is pleased to announce that it has initiated a scheme to provide financial assistance up to a maximum of USD 1000.00 per year for the researchers of University of Peradeniya to facilitate publishing their research findings in high-ranking peer reviewed journals.

### Financial Assistance:

USD 500 per author up to a maximum of USD 1000 per paper per year.



### Eligibility Criteria

- > The applicant should be a permanent staff member of the University of Peradeniya and one of the authors of the journal article.
- > The University of Peradeniya should have been identified as the sole affiliation or one of the affiliations. Journal articles which do not carry the University of Peradeniya as an affiliation are not eligible for funding.

# Workshop on Grant writing and Management



## Workshop on Grant writing and Management

**Date:**  
**30/03/2022 via Zoom**

This half a day workshop is ideal for early career researchers but researchers in any point of their research career is welcome to join.

The agenda of the workshop:

9:00 am – 9.45 am	How to write a good research proposal?	Prof. J.B. Ekanayake, Director URC
9.45 am – 10.30 am	Best practices to manage your research grant	Prof. S.H.P. Parakrama Karunaratne Senior Professor and Chair of Zoology
10.30 am – 10.45 am	Tea and Refreshment (onsite participants)	
10.45 am – 11.30 am	Procurements and budget management	Mr.S.P Jayakody, Senior Assistant Bursar
11.30 am – 12.15 pm	Discussion Forum	Prof. Rupika Rajakaruna, Prof. R. D. Jayasinghe, & Prof. M. I. Fazeeha Azm



**TOPIC: WORKSHOP ON GRANT WRITING AND MANAGEMENT**  
**TIME: MAR 30, 2022 08:00 AM MUMBAI, KOLKATA, NEW DELHI**

Join Zoom Meeting

<https://learn.zoom.us/j/62719490617?pwd=L2E5Z2hQOUtIOVAxZUZ0Sjg5T1R0Zz09>

**Meeting ID: 627 1949 0617**  
**Passcode: g%%Vur4J**

Organized by the University Research Council  
University of Peradeniya



# PURSE 2022



## PURES – 2022

### INVITATION



**Peradeniya University Research Excellence Showcase**

**Date: March 23, 2022**

Director, the Board of Management,  
and the Management Committee  
of the University Research Council  
have the pleasure of inviting you to  
the 1st Peradeniya University  
Research Excellence Showcase  
**PURSE – 2022**

The Chief Guest of the Event is  
**Senior Professor Sampath Amarathunge**  
Chairman of the University Grant Commission

on  
Wednesday, 23rd March 2022  
at  
9.00 a.m.

Please register through the following link

<https://forms.gle/oY3yWNhN6t2qfeHW7>

*we will send the joining instructions soon*

#### Programme

9:00 – 9:30	Registration
9:30 – 9:35	Welcome address by the Director, URC
9:35 – 9:45	Address by the Vice Chancellor, University of Peradeniya
9:45 – 10:00	Address by the Chief Guest, Prof. Sampath Amarathunge, UGC/Chairman
10:00 – 10:20	Felicitating Researchers <ul style="list-style-type: none"><li>● Top 2% researchers</li><li>● Tier 4* researchers</li></ul>
10:20 – 11:45	Tea and exhibition
11:45 – 12:15	Research Presentations
12:15 – 13:00	Q&A with a panel discussion: Issues faced by researchers and devising supporting mechanism for Researchers at UoP
13:00 – 14:00	Lunch and exhibition



# Multidisciplinary Research Grants

## [MRG]

## Multidisciplinary Research Grants

## [MRG]



The University Research Council [URC] is pleased to announce it has initiated a scheme to provide up to 8 multidisciplinary research grants. Two grants will be top up by the Postgraduate Institute of Science (PGIS) with some conditions.

The grants are provided for 18 months but researchers are encouraged to utilise the funds within the first year. For the current year, the theme of the applications is kept open but should be in multidisciplinary nature. Some examples are: Health and wellbeing; Culture, Creativity and Inclusive Society; Digital, AI and Big Data; Climate, Energy and Mobility; Food, Bioeconomy, and Agriculture; Global Development Futures; AI-augmented learning; Resilient Infrastructure with Sustainability and Equity; Imaging Science; Sustainable societies; Digital frontiers; Transformative technologies; Creativity and Design; Medical and Digital Humanities; etc.

### Financial assistance:

Seven to eight (7 - 8) grants up to Rs 2,500,000 will be disbursed. Out of these, two will be top-up by the PGIS for funding equivalent to 1 year RA position. Funds can be used for the following:

Funding for a research assistant at a rate of Rs 50,000 a month for 12 months (only 2/3 of the grant period)

Minor equipment less than 1 million rupees and other research expenses such as funds required for chemicals, electronic components, sensors and probes, etc.

### Eligibility Criteria:

The Principal Investigator should be a permanent staff member of the University of Peradeniya.

There should be at least two Co-Investigators out of which one should be from a different faculty to the Principal Investigator.

Funds cannot be used in concurrently with another grant

The URC reserves the right to amend the eligibility criteria.

### Procedure:

The applicant should fill in an online application form. Upon receiving the applications, the URC will follow the following procedure for disbursement, monitoring and evaluating the grants:

Applications will be forwarded to the Management Committee members of the faculties involved for initial screening and suggesting the reviewers.

The short-listed applications will be forwarded to reviewers' comments.

Upon receiving the reviewers' comments, the Management Committee will decide the grant applications to be funded

Selected applications will be forwarded to the Senate Research Committee for concurrence.

Monitoring and evaluating process will be same as the other university grants.

### Applications:

Applications are four parts:

Part I – Information about the Principal Investigator (online entry)

Part II- Project Proposal (Upload as a pdf)

- Title of the Project
- Background/justification/rationale of the project while summarizing the present state of knowledge of the field of the proposed research
- Research problem /research question that your research seeks to address
- State the hypothesis to be tested (if any)
- List the Objectives of the research
- Description of the proposed research
  - Research Design (work packages)
  - Methodologies
  - Data analysis including statistical and analytical methods (if any)
  - Timeline with clear milestones
- Significance of the proposed research (Also, state the Overall relevance/importance of the project to the Applicant/ Department / Faculty /University/ Society)
- Expected outputs of the project
- Give a List of References cited (Please use Author /Year System):
- Describe the experience and outputs of the research team in relation to the proposed research

Part III- Budget in a prescribed format (Upload as a pdf)

Part IV- CVs of the PI and Co-Is (Upload as a single pdf)

### Deadline:

Expression of Interest

18/03/2022

<https://forms.gle/A65Xm3uY1eWgTd6N7>

Full Proposal

25/03/2022

submission portal through

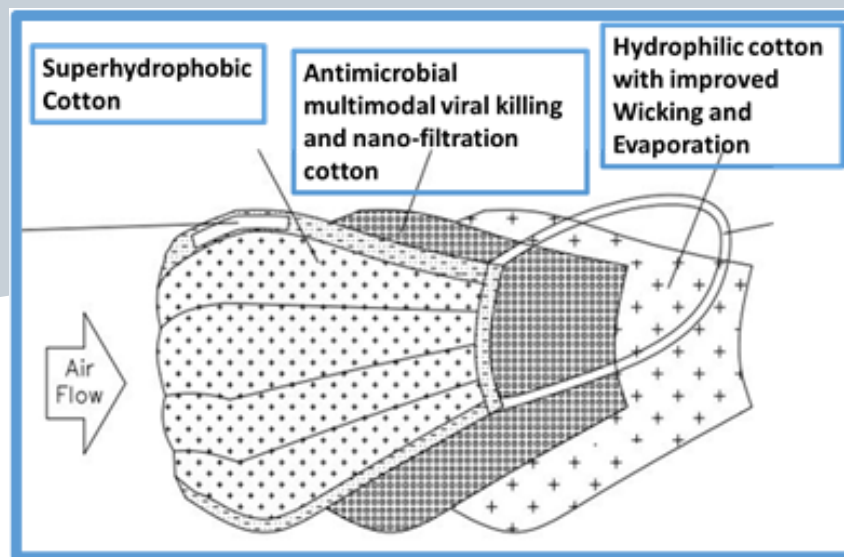
<https://rgms.pdn.ac.lk/login.php>

# Our Product

THE FIRST COMMERCIALIZED PRODUCT OF  
UNIVERSITY OF PERADENIYA RESEARCH  
OUTCOMES-RESPIRONE NANO AV 99 FACE MASK

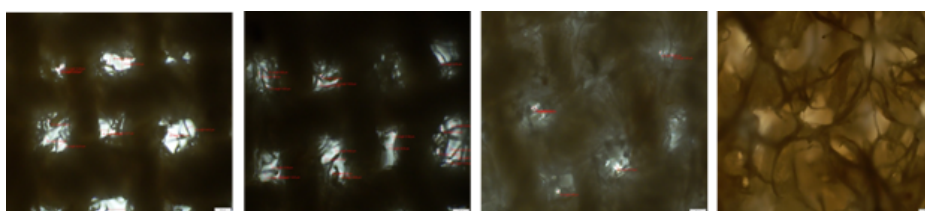


A novel technology for fabricating a 3-ply face mask with superhydrophobic outer layer, particle retention, bacteria and virus destroying middle layer and hydrophilic inner layer developed and converted to a marketable product. The outer layer is composed of superhydrophobic cotton that is capable of reflecting aerosol particles containing viruses and bacteria and stain coming with water and blood droplets. This ensures that aerosol particles containing viruses and bacteria are not transmitted through this layer. However, if any aerosol particle containing viruses or bacteria or other particles are penetrated through the upper layer and reach the middle layer, the microparticles used to cover the pores of the cotton fabric will bind them electrostatically and mechanically not allowing them to pass through this layer. The star-shaped nanoparticles with sharp nano-blades attached to the fabric in the middle layer destroy the microbes through mechanical action similar to cutting spike proteins of corona viruses by scissors or by damaging the bacteria cell membranes. There are four other mechanisms by which these nanoparticles are capable of destroying microbes. The inner-most face contacting layer is made of hydrophilic cotton to give comfort to the wearer and to allow good breathability. The three layers of the face mask are shown in Figure 1.



**Figure 1: Schematic illustration of the three layers of Respirone Nano AV 99 facemask**

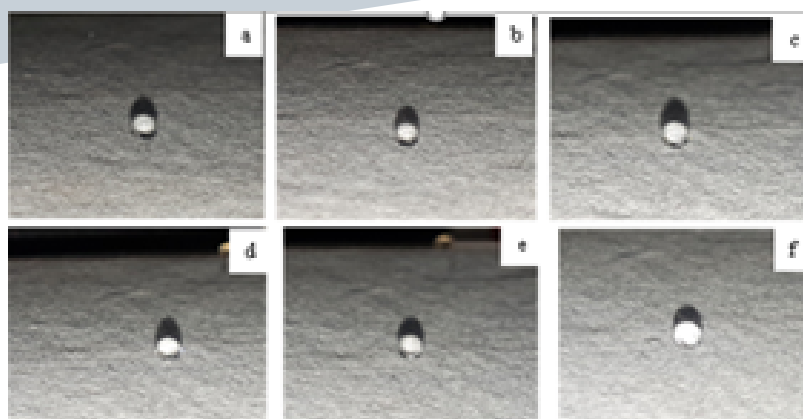
Several instruments and test methods have been developed to characterize these face masks. The face masks pass all the required tests: bacterial filtration 99.8–99.9% (ITI test result), adjustable particle filtration at 300 nm and above (at a desired value between 20%–80% at 300 nm and over 80% above 300 nm), acceptable breathability below 60 Pascal, increased flammability results well over the minimum required level of 10 seconds (28 to 70 seconds), blood retention from the upper layer due to its superhydrophobic effect. Also, all the materials used in making face masks, the polybag and the cardboard box used to store a single mask and the box used to store 50m of such boxes of masks are all bio-degradable, eco-friendly and environmentally-friendly. The technology development has now been converted to a marketable product and Sarasavi Industries Pvt. Ltd. has already signed a Letter of intent and an MoU and agreement will be signed soon. The product is currently at the manufacturing stage and sales within the country will be handled by the State Trading Corporation. Overseas sales and related export avenues will be handled by the Sarasavi Exports Pvt. Ltd. through a separate MoU and Agreement between the University of Peradeniya and Sarasavi Exports Pvt. Ltd. Figure 2 shows the optical images of the cotton fabric with progressively blocking the pores to different extents.



**Figure 2: Optical images of cotton fabric when the pores are blocked to different extents.**



The optical images of a water droplet on the outer layer fabric demonstrating the superhydrophobicity and RSV antigen test results for the ZnO nanoparticles used to fabricate middle layer are shown in Figure 3



ZnO Conc. Received 15%	<i>S. Aureus</i> ATCC 25923			<i>E. Coli</i> ATCC2592			<i>P. Aeruginosa</i> ATCC27853		
	1	2	3	1	2	3	1	2	3
Con. tested	-	-	-	-	-	-	-	-	-
3 %	-	-	-	-	-	-	-	-	-
1.5%	-	-	-	-	-	-	+	+	+
Control	+	+	+	+	+	+	+	+	+

Figure 3: The optical images of a water droplet on the outer layer fabric demonstrating the superhydrophobicity (left) and ERSV antigen test results for the ZnO nanoparticles used to fabricate middle layer.

Figure 4 shows bacteria filtration test results obtained from Industrial Technology Institute. The London Virology Test Report shows the virucidal effect of the middle layer fabric against SARS CoV-2. Antibacterial tests performed at the Department of Microbiology, Faculty of Medicine, University of Peradeniya confirms antibacterial effects of the middle layer fabric against both Gram positive and Gram negative bacteria selected for the study.

Results & Interpretation					
Test /Units	Test Results				
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Bacterial Filtration Efficiency (BFE) %	99.80	99.99	99.99	99.80	99.99

According to the results test item comprises 99.80% of physical barrier property against tested bacterial culture.

Figure 4: Bacteria filtration test results obtained from Industrial Technology Institute.

### Nanoparticle safety:

No change of micro and nanoparticles after 15 washing cycles (XRD and XRF Studies).

Chemically attached to the fabric.

No direct body contact of modified cotton.

No irritation or other adverse health effects.

Non-toxic as per mouse model tests.

Commonly used in body and face creams and lotions.

Environmentally friendly materials.

### Summary of Properties:

Superhydrophobic, mouldable outer layer to repel aerosol particles and to prevent blood penetration, water, and stain resistance.

High-grade filtration middle layer with increased efficiency via mechanical and electrostatic filtration with multimodal bactericidal and virucidal effects.

Hydrophilic inner cotton layer giving excellent wicking and evaporation for comfort to wearer.

Excellent breathability.

Use of commonly available, low-cost material of environmentally friendly, biodegradable cotton fabric.

Unique configurations for tight fit.

Adjustability for different cohorts within the population.

Free of fluid clogging and excellent breathability.

Washability up to 25 times and reusability.

Resistance to common modes of disinfection and cleaning.

**Prof. R.M. Gamini Rajapakse**

**Senior Professor**

**Faculty of Science, University of Peradeniya**

# Analysis

## Randomized Controlled Trials in the Social Sciences

Suresh de Mel

Department of Economics & Statistics and Postgraduate Institute of Humanities and Social Sciences,  
University of Peradeniya.

At its foundation, a randomized controlled trial (RCT) involves selecting a group of subjects, carrying out an intervention with a randomly selected sub-group whilst the remaining group does not receive the intervention and then observing the difference in impact across the two groups. Historically, these methods have generally been popular in the hard sciences – for example, in the medical field, to test the efficacy of a new drug or new treatment regimen. However, over the last 25-30 years these methods have also been adopted by a wide array of fields within the social sciences too.

The classical RCT has three important components:

- **Independent and Dependent Variables:** The RCT experiment examines the effect of the independent stimulus (either present or absent) on a dependent outcome. Both independent and dependent variables need to be operationally well-defined before the experiment begins.
- **Pre-testing and Post-testing:** Subject are measured in terms of the dependent variable both before and after the intervention. Any difference in the measure of the dependent variable is attributed to the presence of the independent stimulus.
- **Treatment and Control Groups:** The group that received the stimulus (treatment) is compared against the group that did not (control). For this to be valid, the groups need to be similar in all material aspects. Randomization is the preferred standard for allocation into treatment and control groups.

As an example, let's take an education related experiment run in rural Udaipur, India, where Seva Mandir, an Indian NGO, runs one-teacher schools for groups of about 20 students in rural areas that do not have government schools[1].

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[1] Duflo, Esther, Rema Hanna and Stephen P. Ryan. 2012. "Incentives Work: Getting Teachers to come to School". American Economic Review, Vol 102 No 4, pp. 1241-1278.

Teacher absenteeism is high at about 44%. The researchers designed a camera programme (with date and time stamp) where teachers were required to take a photograph of themselves with the students at the beginning and end of the school day (separated by at least 5 hours) and an incentive payment was made for each valid day. To measure the effectiveness of the intervention, half of the schools were randomly assigned to an incentive based pay scheme whilst the remaining half had a fixed monthly amount. The study found that teacher absence reduced significantly – from 42% in the control group to 21% in the treatment group. Meanwhile, 36% of schools in the treatment group reported having greater than 90% teacher attendance (compared to 1% in the control group). As a result of greater teacher presence leading to more teaching time, the students in the treatment schools also returned better test scores.

In a health related experiment, researchers looked at the effect of small incentive payments for children’s immunizations in Rajasthan, India[2]. The experiment was conducted in areas where the rate of immunization is very low – with only 1% of children being fully immunized by the age of 2. Even though immunization is offered free at local health centres, there is a high absence rate (45%). Hence parents are reluctant to incur travel costs and having to deal with the uncertainty of the centre being closed. As part of the experiment, immunization camps were set up on a fixed day of the month in approximately half of the study villages; this eliminates the uncertainty effect. In half of these treatment villages, mothers were provided some dry rations; this compensates for their travel costs. The study found that even though all camps were well attended, the camps with dry rations had five times greater attendance than the camps without dry rations. Small incentives help to reduce future health costs for both the families and society.

In another study, researchers examined the effect of general business training on current and potential female small business owners in urban Sri Lanka[3]. A randomly chosen sub-group in both samples received business training and half of those who completed training were eligible for a small capital grant for their business. Follow-up surveys looked at the effect on business practices and business outcomes in both the short-term and medium-term.

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[2]Banerjee, Abhijit, Esther Duflo, Rachel Glennerster and Dhruva Kothari. 2010. “Improving Immunization Coverage in Rural India: Clustered Randomized Controlled Evaluation of Immunization Campaigns with and without Incentives”. *British Medical Journal*, Vol 340, p. 2220.

[3] de Mel, Suresh, David McKenzie and Chris Woodruff. 2014. “Business Training and Female Enterprise Start-up, Growth and Dynamics: Experimental Evidence from Sri Lanka”. *Journal of Development Economics*, Vol 106, pp. 199-210.

The study found that training led to improvements in business practices among current firms but training alone did not have a significant impact on business outcomes. However, training and cash grants together did have a positive impact on some business outcomes – but these effects were short-lived.

At an international level, the Abdul Lateef Jameel Poverty Action Lab (JPAL) at MIT and Innovations for Poverty Action (IPA), New Haven have been at the forefront in conducting RCTs in a wide variety of fields. These include areas such as agriculture, education, energy and environment, microfinance/microenterprise, health, labour markets, water and sanitation, political economy and governance.

The RCT methodology is not without limitations. These include (1) the difficulty of separating out effects when they are closely linked, (2) non-uniformity in the implementation of interventions, (3) internal validity issues (eg. when the control group is contaminated by receiving some spillover treatment effects), (4) external validity issues (eg. when the experiment may not be replicable in a different setting) and (5) being resource-heavy and time consuming.

Despite these limitations, the RCT methodology remains firmly etched as the golden standard for testing the effectiveness of interventions in a wide variety of social science settings. Funding opportunities for research abound. The methodology lends itself easily for testing out new innovations in products and services and also for multi-disciplinary research. The strongest stamp of credibility was given when Abhijit Banerjee (MIT), Esther Duflo (MIT) and Michael Kremer (Harvard) were awarded the Nobel Prize for Economics in 2019 for their trailblazing work in using this methodology.