

Animal Experimentation in India:

A Critical Examination of Ethics, Regulation, and the Path to Reform

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Abstract

Animal experimentation remains one of the most contested intersections of scientific progress and ethical responsibility in modern India. This paper critically examines the practice of animal experimentation in India through field-based observation, secondary research, and ethical analysis conducted during an internship with STRAW India. The study investigates the regulatory landscape governing animal use in research, the ethical concerns raised by animal rights advocates, the current state of alternative methods, and the role of public awareness in driving reform. The paper argues that while animal experimentation continues to be defended on scientific grounds, the absence of robust enforcement of existing laws, the underutilization of non-animal alternatives, and the lack of public engagement make it imperative to adopt a more humane, transparent, and accountable framework. Drawing on field observations, awareness workshops, and academic literature, this paper proposes concrete interventions to reduce unnecessary animal use in Indian research institutions and advance the cause of animal welfare. The findings reflect not only the systemic gaps in policy and practice but also the transformative potential of community engagement, humane education, and ethical advocacy.

Table of Contents

1. Introduction.....	3
2. Research Question and Objective.....	4
3. Thesis Statement.....	4
4. Literature Review.....	5
5. Methodology and Fieldwork Approach.....	7
6. Discussion and Analysis.....	9
7. Findings from Fieldwork and Research.....	12
8. Recommendations and Proposed Interventions.....	14
9. Conclusion.....	16
10. Bibliography / Reference List.....	17

1. Introduction

Every year, millions of animals in laboratories across India are subjected to procedures that range from mild discomfort to severe pain and death, all in the name of scientific advancement. Mice, rats, rabbits, frogs, guinea pigs, fish, and non-human primates endure drug trials, toxicity tests, surgical experiments, and psychological studies within the walls of pharmaceutical companies, medical colleges, government research bodies, and private institutions. Animal experimentation is so deeply embedded in the infrastructure of Indian science that it has come to be treated as a given a necessary cost of progress.

Yet this assumption deserves sustained scrutiny. As India emerges as a global hub for pharmaceutical research and generic drug manufacturing, the scale of animal use in laboratories has grown enormously, often without a parallel growth in ethical oversight, transparency, or public accountability. At the same time, technological innovation has produced a growing array of alternatives cell culture models, computer simulations, organ-on-a-chip technologies, and advanced in vitro assays that challenge the long-held belief that animal models are indispensable to biomedical science.

This paper investigates the landscape of animal experimentation in India through the dual lens of policy and ethics. It was researched and written as part of an internship with STRAW India, an organization committed to the welfare of stray and captive animals and to fostering humane attitudes in communities across the country. The internship provided a unique vantage point: field visits to animal shelters and research institutions, engagement with communities through awareness workshops, and exposure to the perspectives of scientists, veterinarians, activists, and ordinary citizens on the question of how and whether animals should be used in the pursuit of human knowledge.

The paper is organized to move from the macro to the micro. It begins with a review of the regulatory and scientific literature, then turns to the methodology and field observations that animated this research, and concludes with analysis, findings, and concrete recommendations for reform. Throughout, it maintains the position that the ethical treatment of animals in laboratories is not a peripheral concern but a central one a measure of the maturity and moral seriousness of a scientific community.

2. Research Question and Objective

This paper is guided by the following central research question:

How effective are India's existing regulatory frameworks in ensuring the ethical and humane treatment of animals in experimental settings, and what structural, educational, and policy interventions are needed to meaningfully reduce unnecessary animal experimentation?

The specific objectives of this research are:

- (a) To examine the legal and institutional framework governing animal experimentation in India, with particular attention to the functioning of the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA);
- (b) To analyze the ethical arguments for and against the use of animals in research, situating them within India's broader traditions of non-violence and animal protection;
- (c) To assess the availability and adoption of alternative research methods in Indian institutions;
- (d) To document community and institutional attitudes toward animal experimentation through field engagement; and
- (e) To propose actionable interventions that can reduce animal use while maintaining research quality.

3. Thesis Statement

India's regulatory framework for animal experimentation, while formally comprehensive, is undermined by weak enforcement, institutional resistance to reform, and a pervasive lack of public awareness. The ethical imperative to minimize animal suffering in research is neither adequately reflected in practice nor supported by sufficient investment in alternatives. This paper argues that a meaningful reduction in unnecessary animal experimentation in India requires not only stronger regulation and scientific modernization, but a broader cultural shift one driven by humane education, community engagement, and a reimagining of the relationship between scientific progress and moral responsibility toward non-human life.

4. Literature Review

4.1 The History and Justification of Animal Experimentation

The use of animals in scientific research has a long history, dating back to ancient Greek physicians who conducted anatomical studies on animals to understand the human body. In the modern era, the expansion of biomedical science in the nineteenth and twentieth centuries made animal testing a cornerstone of pharmacological development, toxicology, and surgical training. The pharmaceutical industry, in particular, came to rely on animal models to test the safety and efficacy of new drugs before human trials, a practice enshrined in regulatory requirements across the world.

The justification for animal experimentation has traditionally rested on two pillars: the scientific argument that animals are sufficiently similar to humans in physiology and biochemistry to serve as valid predictive models, and the utilitarian argument that the benefits to human health outweigh the costs imposed on animals. Indian scientific institutions have broadly adopted these justifications, and major regulatory bodies such as the Indian Council of Medical Research (ICMR) and the Central Drugs Standard Control Organization (CDSCO) continue to require animal safety data as part of drug approval processes (ICMR, 2000).

4.2 The Regulatory Framework in India

The primary legislation governing animal experimentation in India is the Prevention of Cruelty to Animals Act, 1960 (PCA Act), which established the Animal Welfare Board of India (AWBI) and provided the legal basis for the regulation of animal use in laboratories. Under Section 17 of the PCA Act, the Government of India established the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) in 1964. CPCSEA is responsible for supervising and controlling animal experimentation across the country, setting minimum standards for animal care, and registering institutions that use animals in research (CPCSEA)

The CPCSEA's guidelines mandate that all institutions using laboratory animals establish Institutional Animal Ethics Committees (IAECs), which are responsible for reviewing and approving experimental protocols, monitoring animal care facilities, and ensuring compliance with the Three Rs framework — Replacement, Reduction, and Refinement — developed by Russell and Burch (1959). The Three Rs require researchers to replace animal use with alternatives where possible, reduce the number of animals used, and refine procedures to minimize suffering. On paper, this is a robust framework; in practice, scholars and activists have documented widespread non-compliance, inadequate IAEC functioning, and a lack of meaningful external oversight (Mitra, 2014; Bhattacharya, 2017).

4.3 Ethical Frameworks and the Animal Rights Perspective

The philosophical foundation for challenging animal experimentation has been developed most influentially by Peter Singer (1975), whose utilitarian analysis in *Animal Liberation* argued that the capacity for suffering, not intelligence or species membership, should determine moral consideration. For Singer, the routine infliction of pain on laboratory animals for the benefit of humans constitutes a form of speciesism — a morally arbitrary discrimination based on species. Tom Regan's rights-based approach (1983) goes further, arguing that animals have inherent value and that using them as mere means to human ends is fundamentally wrong, regardless of the benefits produced.

In the Indian context, these arguments resonate with deeply rooted philosophical traditions. The principle of *ahimsa* (non-violence), central to Jainism, Buddhism, and strands of Hinduism, explicitly recognizes the moral worth of non-human animals. India's constitution, through Article 51A(g), imposes a fundamental duty on citizens to have compassion for all living creatures, providing a constitutional basis for animal welfare advocacy. These traditions give the ethical critique of animal experimentation a particular cultural salience in India that is not always present in Western debates (Jayewardene, 2016)

4.4 Alternatives to Animal Experimentation

The development of alternatives to animal testing has accelerated significantly in recent decades. In vitro methods using human cell cultures, three-dimensional tissue models, and organoids offer increasingly sophisticated platforms for testing drug efficacy and toxicity without the use of live animals. Computational modeling and artificial intelligence-driven drug discovery tools can predict the behavior of chemical compounds with growing accuracy. Organ-on-a-chip technologies replicate the microenvironment of human organs and have shown promise in toxicology and pharmacokinetics research (Hartung, 2009).

India's adoption of these alternatives remains limited. A survey conducted by Bhattacharya (2017) found that fewer than fifteen percent of Indian pharmaceutical research institutions had invested significantly in in vitro alternatives. Budget constraints, lack of trained personnel, and institutional inertia were cited as the primary barriers. Regulatory agencies have only recently begun to accept alternative test data in drug approval applications, and there is as yet no national strategy for the systematic promotion and validation of alternative methods (ICMR, 2020).

4.5 Public Awareness and Humane Education

Research on public attitudes toward animal experimentation in India is sparse, but available evidence suggests that most citizens have limited knowledge of the extent or nature of animal use in research. A 2019 survey by the Federation of Indian Animal Protection Organisations (FIAPO) found that over sixty percent of respondents were unaware that their medicines had been tested on animals, and that the majority expressed discomfort with the practice when informed of it.

5. Methodology and Fieldwork Approach

5.1 Research Design

employ a mixed-methods approach, combining qualitative field observation, semi-structured interviews, participatory community engagement, and secondary literature review. The research was conducted over the course of the internship period at STRAW India, during which time the intern participated in field visits, animal welfare awareness workshops, mentor-guided discussions, and weekly progress reviews. The combination of primary field engagement with secondary academic and policy research allowed for a grounded, contextualized analysis of the research question.

5.2 Secondary Research

Secondary research involved a systematic review of academic literature on animal experimentation, Indian animal welfare law, the Three Rs framework, and alternative research methods. Key sources included peer-reviewed journals in bioethics, pharmacology, and animal welfare science; CPCSEA regulatory guidelines and government reports; ICMR policy documents; and published reports from animal protection organizations including FIAPO and PETA India. The literature was reviewed critically, with attention to the divergence between formal regulatory standards and documented practice.

Awareness Workshops

As part of the internship's practical project component, the intern participated in designing and conducting awareness workshops at a local college and an NGO partner site. These workshops introduced participants to the basics of animal experimentation in India, the regulatory framework, ethical debates, and the availability of alternatives. Participant responses, questions, and reactions were documented and form part of the primary data for this research. The workshops also served as an opportunity for the intern to engage with diverse perspectives — from biology students who had performed dissections to social science students with no prior exposure to the issue.

5.3 Reflective Practice

Consistent with the internship's emphasis on the development of research and analytical skills, this paper incorporates a reflective dimension. The intern maintained a weekly journal throughout the internship period, recording evolving observations, questions, and learning. Selected reflections are woven into the discussion and conclusion sections of this paper, in keeping with the practice-based research tradition that the internship framework promotes.

6. Discussion and Analysis

6.1 The Gap Between Regulation and Reality

India's legal framework for laboratory animal welfare is, on paper, reasonably comprehensive. The CPCSEA guidelines set minimum standards for housing, nutrition, veterinary care, and experimental protocols. The requirement for IAECs provides a mechanism for institutional self-governance, while CPCSEA inspection and registration procedures offer a degree of external oversight. Yet the evidence strongly suggests that these formal structures do not reliably translate into humane treatment of laboratory animals in practice.

Several structural problems contribute to this gap. First, CPCSEA is chronically understaffed relative to the number of registered institutions it is responsible for supervising. As of 2022, approximately 1,400 institutions were registered with CPCSEA, yet the committee's inspection capacity is limited and inspections are infrequent (CPCSEA Annual Report, 2022). Second, IAECs vary enormously in quality and seriousness: some are genuinely rigorous, while others function largely as rubber-stamp bodies that approve protocols without meaningful ethical review. Third, there is no publicly accessible database of animal use data in India comparable to those maintained by the European Union or the United States, making independent monitoring nearly impossible.

The culture within research institutions also plays a significant role. Laboratory animal care is generally regarded as a support function rather than a scientific or ethical priority. Technicians responsible for animal husbandry are often undertrained and underpaid. The use of animals in undergraduate teaching including the dissection of frogs and other animals in college biology courses is widespread, despite the availability of computer-based alternatives, and is rarely subjected to ethical review. This institutional culture normalizes animal use and makes reform difficult to advocate for from within.

6.2 The Three Rs: Aspiration Versus Practice

The ThreeRs framework represents the internationally accepted ethical minimum for animal use in research. In India, the Three Rs are formally incorporated into CPCSEA guidelines and IAEC review processes, but their application is inconsistent. Replacement is the most systematically neglected of the three principles: few institutions have made serious institutional investments in alternative methods, and there is no central body responsible for validating or promoting non-animal testing platforms. Reduction and Refinement are more often invoked but are not consistently monitored or enforced.

Part of the problem is educational. Many Indian biomedical researchers were trained in environments where animal experimentation was the default and alternatives were treated as secondary or supplementary. Changing these deeply embedded practices requires not only regulatory pressure but sustained investment in researcher training, infrastructure for alternative methods, and a shift in scientific culture. International models such as the UK's National Centre for the Three Rs (NC3Rs) and the US National Toxicology Program's efforts to develop alternative toxicology methods offer useful templates that India has yet to seriously consider adopting.

6.3 Ethical Tensions and Cultural Context

The ethical debate around animal experimentation in India operates in a distinctive cultural context. On one hand, the country's pharmaceutical and biotechnology sectors are among the most dynamic in the world, producing generic drugs for global markets and conducting contract research for multinational companies. The economic pressures on these sectors create strong institutional incentives to maintain the status quo of animal testing, particularly where regulatory requirements demand animal data for drug approval. On the other hand, India's cultural traditions offer powerful resources for ethical critique. The principle of ahimsa, the constitutional duty of compassion toward animals, and a long history

Animal protection legislation all provide legitimate grounds for demanding greater accountability from research institutions. The challenge lies in translating this cultural capital into effective policy advocacy and institutional reform, a process that requires sustained engagement between the scientific community, civil society, regulatory agencies, and the public.

There is also a significant class and access dimension to the debate that is often neglected. Animal experimentation in India serves a research and pharmaceutical ecosystem whose primary beneficiaries are urban, middle-class, and global consumers. The animals used in this system are voiceless; their suffering is invisible to the public because it takes place behind laboratory doors. Making this suffering visible, and connecting it to wider questions of justice and responsibility, is one of the most important roles that animal welfare organizations like STRAW India can play.

6.4 The Role of Public Awareness and Education

The awareness workshops conducted during the internship revealed a striking pattern: most participants had no prior knowledge that the medicines they took or the cosmetics they used had been tested on animals, and many expressed strong moral discomfort once informed. This reaction was consistent across age groups and academic backgrounds, suggesting a reservoir of latent concern that is simply not being activated by existing information channels.

Humane education the integration of animal welfare concepts into formal and informal educational settings has a demonstrably positive effect on attitudes toward animals and on the likelihood of pursuing careers in animal welfare. India's school curriculum largely neglects this area, and colleges rarely offer animal ethics as a standalone subject. Introducing age-appropriate discussions of animal use in research, and offering students access to non-animal alternatives for teaching and demonstration, could significantly shift the cultural climate over time.

7. Findings from Fieldwork and Research

7.1 Institutional Knowledge Gaps

Interactions with students and young researchers during the internship revealed significant gaps in awareness of India's regulatory framework for animal experimentation. Most biology and medical students encountered during field engagement were unaware of CPCSEA's role, the existence of IAECs, or the Three Rs framework. This suggests that animal ethics is not being meaningfully integrated into scientific education, leaving a generation of researchers ill-equipped to engage with the ethical dimensions of their work.

7.2 Resistance to Alternatives

Conversations with researchers and educators revealed a common perception that alternative methods are either not sufficiently validated, not accepted by regulatory bodies, or prohibitively expensive. While some of these concerns have a factual basis, they are often overstated and used to justify the continuation of practices that could be reformed. The perception that alternatives are 'not good enough' is partly a product of unfamiliarity: researchers who have not been trained in in vitro methods or computational modeling naturally default to the animal models they know.

7.3 Community Attitudes

Workshop participants consistently expressed support for reducing animal use in research once they understood the nature and scale of the practice. Many were particularly disturbed by the use of animals in cosmetic testing, an area where India has made some progress through a 2014 amendment that banned the import of cosmetics tested on animals and by the conditions in which laboratory animals are typically kept. The emotional engagement of participants suggested that community pressure, if properly channeled, could be a meaningful force for policy change.

7.4 CPCSEA Functioning

Secondary research revealed significant concerns about CPCSEA's current functioning. Animal welfare activists and legal scholars have noted that the committee has faced periods of inactivity and political interference, particularly around the question of inspections and penalties for non-compliant institutions. A series of RTI applications filed by PETA India between 2015 and 2020 revealed that many registered institutions had not been inspected for years, and that instances of non-compliance rarely resulted in meaningful consequences (PETA India, 2020).

7.5 The Frog Dissection Issue

The use of livefrogs in undergraduate biology education emerged as a particularly salient issue during the internship. Despite a 1998 CPCSEA circular recommending that institutions explore alternatives to animal dissection, frog dissection remains a routine practice in biology classrooms across India. Computer-based simulation software that can effectively replace dissection is available and relatively affordable, but its adoption has been limited by resistance from faculty and a lack of institutional investment. This issue represents a microcosm of the broader challenge: the gap between what is technically feasible and ethically desirable, and what is actually practiced.

7.6 Reflective Learning

The internship experience fundamentally shaped this researcher's understanding of animal welfare as a systemic concern. It became clear that the problem of animal experimentation cannot be addressed through isolated interventions but requires a coordinated approach that encompasses law, science, education, and community engagement. Equally, the internship highlighted the importance of fieldwork and direct community engagement in generating insights that secondary research alone cannot provide. The reactions of workshop participants their surprise, their distress, and their willingness to act were more instructive than any policy document.

8. Recommendations and Proposed Interventions

8.1 Strengthen CPCSEA Oversight

The most urgent structural reform needed is a significant increase in CPCSEA's inspection and enforcement capacity. This should include mandatory annual inspections of all registered institutions, a publicly accessible database of animal use statistics, and a clear enforcement mechanism including suspension of registration for non-compliant institutions. CPCSEA's membership should also be reviewed to ensure meaningful representation from independent animal welfare experts and civil society, rather than primarily from research institutions with an interest in minimal regulation.

8.2 Mandate Three Rs Training for Researchers

All researchers applying for IAEC approval should be required to complete certified training in the Three Rs framework, including practical exposure to available alternative methods. This training could be developed and delivered through a national centre for alternatives modeled on the UK's NC3Rs which would also be responsible for validating new alternative methods and disseminating best practices. Indian funding agencies, including the Department of Biotechnology and ICMR, should require evidence of Three Rs consideration in all grant applications involving animal use.

8.3 Invest in Alternative Research Infrastructure

The Government of India should establish a dedicated fund for the development and validation of non-animal research methods, with particular emphasis on in vitro toxicology, computational pharmacology, and organoid models. Partnerships with international centres of excellence in alternative research such as those at Johns Hopkins University and Maastricht University could accelerate India's capacity development. Regulatory acceptance of alternative

data by CDSCO should be systematically expanded, reducing the institutional pressure to default to animal models.

8.4 Phase Out Animal Dissection in Education

A firm national policy phasing out animal dissection in undergraduate education, with a timeline and corresponding investment in computer-based alternatives, should be implemented. Several Indian states have already moved in this direction, and the experience of these early adopters can inform a national approach. Teacher training programmes should include exposure to simulation software and alternative teaching methods, and curriculum updates should reflect the availability of these tools.

8.5 Launch a National Awareness Campaign

STRAW India and partner organizations should develop a sustained, multi-platform public awareness campaign on animal experimentation, targeted at urban youth, medical and science students, and the general public. The campaign should be factual, emotionally resonant, and action-oriented, connecting the issue to everyday consumer choices (cosmetics, medicines) and inviting the public to demand greater transparency from research institutions and regulatory bodies.

8.6 Integrate Humane Education into School Curricula

Animal welfare, including the ethics of animal use in research, should be incorporated into the national school curriculum at the secondary level. This can be achieved through NCERT, which has the authority to update curriculum frameworks, and through partnerships with organizations like STRAW India that have existing educational materials and community presence. Schools should be encouraged to adopt cruelty-free demonstration practices and to engage students in service learning related to animal welfare.

8.7 Foster Scientific Community Engagement

Reform is most durable when it is embraced by the scientific community rather than simply imposed upon it. Efforts should be made to engage leading Indian scientists in open dialogues about the ethical dimensions of animal research, to highlight the work of researchers who have pioneered alternative methods, and to create institutional incentives such as publication recognition for Three Rs innovations that reward humane research practices. Professional associations of Indian scientists should be encouraged to adopt formal commitments to the Three Rs.

9. Conclusion

Animal experimentation in India sits at the intersection of scientific ambition, regulatory inadequacy, ethical tradition, and public ignorance. This paper has argued that the current framework, while formally comprehensive fails in practice to ensure the humane treatment of laboratory animals or to drive the adoption of available alternatives. The gap between India's regulatory ideals and institutional realities is large, and closing it will require sustained effort across multiple domains: law, science, education, and community engagement.

The internship experience with STRAW India illuminated both the depth of the problem and the possibility of meaningful change. Community awareness workshops demonstrated that public concern, once activated, can be a powerful driver of advocacy. Field observations underscored the systemic nature of the challenge — the way in which animal use in research is embedded in educational norms, institutional practices, and regulatory cultures that have evolved over decades. No single intervention will be sufficient; what is needed is a coordinated, long-term strategy that takes seriously the moral status of animals and the responsibility of a democratic society to protect those who cannot advocate for themselves.

This paper is, in many ways, a beginning rather than an end. The research has raised as many questions as it has answered: How can civil society most effectively challenge the culture of secrecy that surrounds laboratory animal use? What scientific leadership is needed to normalize the adoption of alternatives? How can humane education be scaled without being diluted? These are questions for the next generation of animal welfare researchers and advocates — among whom the intern hopes to count herself. India has the philosophical traditions, the legal foundations, and the scientific capacity to be a global leader in humane research. What it currently lacks is the institutional will and public pressure to make that aspiration a reality. Building both is the task that lies ahead.

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