



DECISION-MAKING
IN BIOSAFETY

LATIN AMERICA

Expansion of
High-Containment
Laboratories

Panel Synthesis |
Introducción by André Mendonça

Panel 1 | 12 August 2026

BIO
LAB

EXPANSION OF HIGH-CONTAINMENT LABORATORIES IN LATIN AMERICA

PANEL SYNTHESIS AND INTERPRETIVE COMMENTARY BY THE MODERATOR

PUBLICATION

BioLab Solutions Panel Series
Decision-Making in Biosafety
Panel 1 · 12 August 2026

PUBLISHED BY

Biological Laboratory Solutions S.A.S. de C.V.
Puebla, Mexico
biolabsolutions.com.mx

CREDITS

Moderator: André Mendonça
Panelists: Carolina Becerril Esquivel, Claudio Mafra, and
Luis Ochoa Carrera
Synthesis and editorial preparation: BioLab Solutions

RECOMMENDED CITATION

BioLab Solutions. 2026. Expansion of High-Containment Laboratories in Latin America: Panel Synthesis and Interpretive Commentary by the Moderator. BioLab Solutions Panel Series: Decision-Making in Biosafety, Panel 1. Puebla, Mexico.

USE

© 2026 Biological Laboratory Solutions S.A.S. de C.V. All rights reserved. Brief excerpts may be quoted with appropriate attribution. Reproduction or distribution of the complete publication requires prior written authorization.

This publication is a synthesis and interpretive record of a panel discussion. It does not constitute a transcript, technical standard, regulatory opinion, specific risk assessment, or substitute for professional advice.

TWO TEXTS, TWO FUNCTIONS

04 **Publisher's Note**

BioLab Solutions

05 **About the Panel**

Questions, Participants, and Purpose

06 **Introduction**

Interpretive Commentary by André Mendonça

10 **Synthesis of the Discussion**

Documentary Record Prepared by BioLab Solutions

20 **Acknowledgements and Series**

Participation, Resources, and Continuity

A PUBLICATION TO CONTINUE THE DISCUSSION

Across Latin America, investment in high-containment laboratories is expanding. New facilities are being planned, built, or proposed in response to public-health needs, research priorities, preparedness concerns, scientific ambitions, and national and international funding opportunities. These developments create important possibilities for the region. They also create obligations that extend far beyond completion of construction.

BioLab Solutions convened this panel because decisions about high-containment capacity are often discussed through the most visible element of the investment: the laboratory. Yet a building is only one component of the capacity it is intended to provide. Whether that capacity can be used safely and effectively over time also depends on competent personnel, reliable engineering and technical support, sustainable financing, maintenance and verification, supply chains, institutional authority, regulation, and the ability to respond when operating conditions change.

The panel brought together three professionals who approached this problem from different but connected perspectives. Carolina Becerril Esquivel considered the criteria that should determine whether investment in a new facility is justified and the long-term commitments created by the decision to build. Luis Ochoa Carrera examined the forces currently driving expansion and the extent to which new infrastructure is aligned with the region's needs and risk profiles. Claudio Mafra considered whether Latin America is developing a complementary architecture of capacities or duplicating facilities without the professional, financial, and institutional resources needed to sustain them. André Mendonça moderated the discussion and subsequently prepared his own interpretation of what the exchange revealed.

This publication brings together two distinct accounts of that discussion. It opens with André Mendonça's interpretive commentary. Rather than attempting to reproduce the panel exhaustively, André identifies the points of convergence, tensions, and outstanding questions that, in his view, emerged most clearly. His contribution provides an interpretive entry point to the publication: it invites readers to consider what the discussion revealed about the relationship among infrastructure, institutional capacity, regional coordination, sustainability, and governance.

The introduction represents André's reading of the exchange. It is not presented as a joint conclusion of the panel, nor does it imply that every panelist endorses each of its formulations. Its value lies precisely in its interpretive character: it brings together ideas expressed from different perspectives and considers what becomes visible when the discussion is viewed as a whole.

The synthesis that follows serves a different purpose. Prepared by BioLab Solutions, it preserves the panelists' initial perspectives and follows the main themes as they developed during the moderated exchange. It is not a transcript. Its purpose is to document the substance and progression of the discussion, including differences of position or emphasis where they were significant. It does not attempt to resolve those differences retrospectively or attribute collective agreement where none existed.

The order of the two texts is deliberate. André's commentary identifies what, in his view, the discussion revealed. The synthesis then provides the broader documentary record through which readers can examine how those interpretations emerged, where the panelists converged, and where different concerns or judgments remained. The commentary offers a lens; the synthesis preserves the underlying discussion with greater breadth and detail.

Neither text is intended to provide the final word on the expansion of high-containment laboratories in Latin America. The purpose is to make the reasoning developed during the panel available for continued examination and to provide a stronger basis for discussing what capacity the region needs, where it should be located, and what commitments institutions must be prepared to sustain once the decision to build has been made.

BioLab Solutions
Puebla, Mexico
August 2026

AN INFRASTRUCTURE QUESTION THAT REQUIRES A SYSTEM-LEVEL VIEW

On 12 August 2026, BioLab Solutions convened the first session in its panel series on decision-making in biosafety.

THE DISCUSSION

The session examined the continuing expansion of high-containment laboratory infrastructure in Latin America. Rather than treating it primarily as a question of technical design or construction, the panel considered the institutional, financial, professional, and governance conditions that determine whether new infrastructure becomes effective and sustainable capacity.

KEY QUESTIONS

- What should justify investment in a new high-containment laboratory?
- When does an identified need require new infrastructure?
- Is the region developing complementary capacities or duplicating facilities?
- What obligations are created by construction, and who must sustain them?
- How should decisions be made when both continuing and stopping an activity create risks?

André Mendonça

Moderator

Carolina Becerril Esquivel

Decision Criteria and Sustainability
Commitments

Luis Ochoa Carrera

Drivers of Expansion and Alignment with
Regional Needs

Claudio Mafra

Distribution, Duplication, and the Long-Term
Regional Perspective

INTERPRETIVE COMMENTARY BY THE MODERATOR

André Mendonça

BUILDING A HIGH-CONTAINMENT LABORATORY DOES NOT, IN ITSELF, CREATE EFFECTIVE CAPACITY.

The panel discussion highlighted that the expansion of high-containment laboratories in Latin America should be understood less as a question of infrastructure and more as a question of institutional and systemic capacity. Although the panelists approached the issue from different perspectives—decision-making criteria and sustainability, regional needs, and the distribution of capacities—their contributions converged on a fundamental conclusion: building a high-containment laboratory does not, in itself, create effective capacity. Genuine capacity depends on infrastructure being linked to a clearly defined need, being operable by competent personnel, having access to sustainable resources, and being integrated into appropriate systems of governance, maintenance, regulation, and response.

A first point of convergence was the need to question the assumption that the availability of funding constitutes, in itself, a justification for construction. The panel suggested that the decision-making sequence should be reversed: the initial question should not be “Can we build a BSL-3?” but rather “What capacity do we need, for what functions, at what level of risk, and what is the most sustainable way to provide it?” This distinction is particularly relevant in a regional context in which public-health needs, research agendas, institutional capacities, and economic and regulatory conditions are highly heterogeneous.

AN ARCHITECTURE OF CAPACITIES

The panel recognized that there are legitimate reasons to strengthen national capacity, but also that an identified need does not automatically imply that every country or institution should develop its own infrastructure.

From a systemic perspective, this introduces an important issue for Latin America: the region needs a better architecture of capacities, not simply a greater number of facilities. At present, decisions may be shaped by national priorities, funding opportunities, or specific institutional projects. More mature regional planning, however, would require an understanding of what capacities currently exist, what functions they can effectively perform, where gaps exist, and which of those functions should be developed locally, nationally, or through regional mechanisms. Without this shared perspective, there is a risk that expansion will produce parallel facilities competing for limited financial and human resources rather than generating complementary regional capacity.

The discussion of national sovereignty and regional cooperation showed, however, that the issue cannot be reduced to a choice between the two. The experience of the COVID-19 pandemic demonstrated that international access to reference laboratories, samples, supplies, and specialized expertise cannot be taken for granted during an emergency. On the other hand, duplicating highly specialized capacities does not necessarily provide greater resilience if facilities lack sufficient resources to remain fully operational.

Another particularly significant issue is the distinction between funding a facility and funding a capacity. Construction and equipment procurement tend to attract attention because they involve defined budgets, timelines, and visible outputs. Yet the performance of a facility over the decades that follow will depend on far less visible resources: specialized maintenance, certification, energy, spare parts, consumables, occupational health, training, and staff retention.

A facility may be technically excellent at the time of its inauguration and nevertheless progressively lose capacity if there is no sustainable model for financing and managing its operation. In this sense, sustainability should not be treated as a stage that follows construction; it should constitute a decision-making criterion from the outset of the project.

ADAPTABILITY, COMPETENCE, AND LIMITS

The discussion of facility flexibility added another dimension to this issue. It is reasonable to design infrastructure with potential future changes in research and diagnostic needs in mind. However, the panel also demonstrated that flexibility has limits. A change in agent, procedure, animal model, or function can substantially alter the risks involved and the controls required.

Adaptability should therefore not be interpreted as the ability to use a facility for any purpose, but rather as the capacity to evaluate and manage changes in mission in a structured manner. This means maintaining mechanisms for risk assessment, engineering modifications, verification, and authorization before new activities are introduced.

The availability of competent personnel emerged as one of the principal potential constraints on regional expansion. New facilities can be constructed relatively quickly compared with the time required to develop professionals capable of operating, maintaining, and overseeing them. If infrastructure expands more rapidly than the specialized workforce, there is a risk that regional expansion will simply distribute already-scarce technical expertise across a larger number of facilities.

ADAPTABILITY DOES NOT MEAN THAT A FACILITY CAN BE USED FOR ANY PURPOSE. IT MEANS THAT THE INSTITUTION CAN EVALUATE AND GOVERN A CHANGE IN MISSION.

WHEN BOTH CONTINUING AND STOPPING CARRY RISK

The part of the discussion that probably generated the greatest tension concerned operation under degraded conditions. The panelists did not present incompatible positions, but they did emphasize different dimensions of the problem. One perspective prioritized the need for objective evidence of system performance and clearly defined limits of acceptable risk. Another drew attention to the consequences that interruption of a critical capacity can have for a national health system. A third emphasized the importance of anticipating such situations through vulnerability analysis, compensatory controls, and clearly defined responsibilities.

The unresolved question, therefore, is not whether degraded conditions are acceptable in the abstract, but how an institution should make a decision when it faces both an increasing biological risk and a significant cost associated with interrupting an essential service.

This discussion revealed an issue of governance. External regulation is important, but it does not replace institutions' internal responsibility. Similarly, audits and certifications are valuable primarily when they generate corrective action and continuous improvement, rather than becoming exercises in formal compliance alone.

The expansion of high-containment laboratories in the region is likely to continue, driven by legitimate needs related to public health, research, preparedness, and scientific sovereignty. The challenge will be to ensure that this expansion produces sustainable, usable capacity rather than infrastructure alone.

Creating opportunities for discussions with broad participation from academia, the private sector, government, and other spheres is essential for fostering the exchange of knowledge and experience, as well as stimulating critical thinking about complex issues that are difficult to address from a single perspective. This panel fully achieved that purpose.

The format also enabled professionals from different countries and institutions to participate, broadening the diversity of perspectives and encouraging exchange beyond institutional and national boundaries. Making the material available for future consultation extends the reach and dissemination of the knowledge and reflections generated during the panel.

A DOCUMENTED RECORD OF THE DISCUSSION

The synthesis preserves the panelists' initial perspectives and follows the principal themes as they developed during the moderated exchange.

It is not a transcript.

Its purpose is to document the substance and progression of the discussion, including differences of position or emphasis where they were significant.

Need and investment · regional capacity · sustainability · adaptability · competence · performance · degraded conditions · governance · lifecycle

ABOUT THE PANEL

On 12 August 2026, BioLab Solutions convened the first session in its Biosafety in Latin America panel series, focusing on the expansion of high-containment laboratory infrastructure in the region.

The panel brought together Carolina Becerril Esquivel, Claudio Mafra, and Luis Ochoa Carrera, with André Mendonça as moderator. The discussion examined why new high-containment facilities are being developed, how decisions about new capacities should be made, and what institutions and governments must consider so that this capacity remains safe, functional, and sustainable over the long term.

The conversation addressed the initial justification for investment, the relationship between national and regional capacity, long-term financing, facility design and adaptability, personnel and technical competence, maintenance, operational decision-making, and governance. This document provides a synthesis of the discussion, not a transcript. It summarizes each panelist's initial perspective and then follows the principal themes as they developed during the moderated exchange. Where the discussion revealed different positions or differences of emphasis, these have been preserved.

INITIAL PERSPECTIVES

The panel began with three sets of questions designed to examine the expansion of high-containment laboratories from different but related perspectives. Carolina Becerril Esquivel addressed the criteria for deciding whether new capacity is justified and the long-term commitments created by that decision. Luis Ochoa Carrera examined the forces driving current expansion and their relationship to the region's actual needs. Claudio Mafra considered the regional distribution of capacity and the conditions that will determine whether current investment produces sustainable capacity over the coming decade.

Carolina Becerril Esquivel: Decision Criteria, Sustainability Commitments, and the Threshold Question

Carolina was asked to consider three related questions:

- When a country or institution decides to build a BSL-3 facility, what criteria should determine whether the investment is justified?
- What financial, technical, and institutional obligations are implicitly assumed when a new high-containment laboratory is built, and how visible are those obligations during the decision-making stage?
- Under what conditions should a country or institution not build a high-containment laboratory, even if funding is available?

Together, these questions addressed a single decision problem: how to determine whether investment in BSL-3 capacity is justified, what long-term commitments follow from that decision, and when the most responsible decision may be not to build.

Carolina placed the decision within biological risk management and institutional capacity rather than infrastructure alone. She proposed five elements that should underpin the decision: a clearly demonstrated and sustained need; a comprehensive assessment of risk and the operating context; knowledge of existing local, regional, or international capacity; the availability and continuing development of competent personnel; and the ability to sustain the facility throughout its useful life. She noted that an emergency may last months or years, while a high-containment facility may remain in service for several decades.

Existing capacity was an explicit part of this framework. Before building a new facility, she argued, institutions should determine whether the need can already be met elsewhere in the country or through regional or transnational collaboration. In some circumstances, strengthening networks may be as important as adding new infrastructure.

Her comments also drew attention to obligations that may receive less consideration during the initial investment decision. Construction creates continuing requirements for qualified personnel, maintenance, certification, training, organizational culture, institutional oversight, and operating resources. These commitments extend throughout the facility's useful life and must be considered when assessing whether an institution can sustain the proposed capacity.

This long-term perspective also underpinned the threshold question of when not to build. Carolina identified several circumstances in which construction should be reconsidered: when there is no demonstrated need, no realistic sustainability plan, insufficient personnel, existing capacity that could be used more effectively, or institutional conditions inadequate to sustain the investment. If the answers to the central decision questions remain uncertain, her position was that it may not yet be the right time to build.

Carolina's initial contribution therefore placed sustainability within the original investment decision. The capacity to operate, maintain, and govern the laboratory over time forms part of the justification for building it.

Luis Ochoa Carrera: Drivers of Expansion and Alignment with Regional Needs

Luis was asked to address two questions:

- What are the principal forces currently driving the construction of high-containment laboratories in Latin America—public-health needs, research agendas, political visibility, or external funding opportunities—and how do they interact in practice?
- To what extent is current expansion aligned with actual regional risk profiles and laboratory demand, as opposed to national or institutional priorities?

These questions considered the drivers of expansion together with the needs that new infrastructure is intended to address. The discussion therefore encompassed demand, institutional ambition, preparedness, research agendas, funding opportunities, and regional risk profiles.

Luis identified several legitimate forces behind current investment: public-health needs, ambitious scientific agendas, aspirations for national sovereignty, access to external or extraordinary funding, and political or institutional positioning. His central concern was not that multiple motivations exist, but that the opportunity to build might replace the justification of whether construction is necessary. Funding can make a project feasible without making it necessary, and the technical ability to design a facility does not demonstrate sufficient demand to sustain it.

He described the regional public-health context in terms of zoonotic diseases, arboviruses, tuberculosis, and emerging and re-emerging respiratory pathogens, together with land-use change, deforestation, urbanization, human mobility, intensive animal production, and climate change. These dynamics provide legitimate reasons to strengthen diagnostic, surveillance, research, and response capacity, without demonstrating that every country or institution needs its own high-containment facility.

The COVID-19 pandemic reinforced concerns about dependence on external laboratories and the practical difficulties of relying on international access during a large-scale emergency. Luis also used Hantavirus research in South America as an example of the value of regional scientific expertise, and the Orion project in Brazil to illustrate how scientific need, national priorities, public funding, technological sovereignty, and international positioning can coexist within the justification for a single large-scale project.

From an engineering and risk perspective, Luis emphasized that the process should begin with the intended work, procedures, and exposure routes, rather than a predetermined containment classification. The required controls should be proportional to the risks identified through a documented assessment.

He characterized the current relationship between expansion and regional need as broadly aligned, but still incomplete and insufficiently systematic. In particular, he argued that Latin America still lacks a clear regional architecture for determining where specific functions are required, what demand they should serve, what level of containment is proportional, which institutions are best positioned to host them, and how they should integrate with existing capacities. He also cautioned against treating Latin America as a homogeneous risk environment, noting differences among the Amazon, the Caribbean, the Andes, Central America, and major urban areas, as well as differences in regulatory capacity, logistics, energy stability, specialized maintenance, and personnel availability.

His initial contribution framed expansion as a question of alignment among need, risk, and capacity, rather than simply growth in the number of facilities.

Claudio Mafrá: Distribution versus Duplication and the Ten-Year Perspective

Claudio was asked to consider the expansion of high-containment infrastructure from a regional and forward-looking perspective:

- Is the region moving toward a complementary network of capacities, or toward the duplication of similar facilities without coordination?
- Looking ahead over the next ten years, what is the most important condition that will determine whether current expansion translates into effective biosafety capacity rather than underused or degraded infrastructure?

The questions were grouped because both concern the likely regional outcome of the current investment trajectory. They shift attention from individual facilities to whether Latin America is developing coordinated and complementary capacity or a fragmented collection of infrastructure that may prove difficult to sustain.

Claudio began with the scale and pace of current expansion. He referred to additional high-containment facilities being planned or built in Brazil and to a survey identifying facilities in Argentina, using these examples to illustrate how rapidly the regional inventory is growing and how difficult it is to assess whether corresponding professional, financial, and operational capacity is developing at the same pace.

He stressed the need to distinguish between installed infrastructure and effective capacity. Buildings and equipment are the most visible elements of investment, but their existence does not demonstrate that a laboratory has the personnel, technical support, operating systems, supply chains, or financial resources needed to perform its intended function over time. His formulation was especially direct: the region does not simply need more laboratories; it needs the right capacity, in the right place, with the right governance.

This distinction shaped his assessment of regional duplication. He noted that some research institutions already contain multiple high-containment facilities and questioned whether continued duplication within the same sites necessarily represents the best use of capacity. He also stressed that high-containment facilities are not simply upgraded BSL-2 laboratories; their construction, operation, financing, and logistical requirements are fundamentally different and involve continuing costs and specialized supply chains.

For the coming decade, Claudio placed particular emphasis on professional competence, regulation, engineering and vendor capacity, sustainable financing, and clearer responsibility for long-term risk. He advocated stronger strategic criteria and national frameworks defining minimum expectations from project development through operation. He also emphasized the need for engineers, architects, managers, and operators to work together from the conceptual stage rather than treating design and operation as separate activities.

His ten-year perspective therefore incorporated sustainability directly into the assessment of current expansion. The ultimate measure of success will not be the number of facilities built during the current investment period. It will be whether those facilities remain operational, technically competent, and connected to real scientific and public-health needs.

Claudio's initial contribution shifted the unit of analysis from the individual laboratory to the regional system of capacities: what exists, where it exists, whether it is complementary or duplicative, and whether it can continue to perform its intended function over time.

From Demonstrated Need to Investment in Infrastructure

The initial contributions established different entry points into a common problem: what should precede the decision to build.

As the discussion progressed, the panel returned repeatedly to the relationship among the intended activity, its risks, and the infrastructure proposed to support it. Public-health preparedness, research programs, scientific autonomy, and access to funding can all influence decisions about new capacities. The panel did not treat these motivations as equivalent or suggest that any one of them, on its own, provides sufficient justification.

Risk assessment occupied a central place in this discussion. The required facility should be derived from the activities to be undertaken and the controls needed to manage their risks. A containment designation such as BSL-3 provides a framework, but it does not define every technical requirement for every program conducted at that level of containment. Luis explicitly linked this approach to the risk-based framework in the fourth edition of the WHO Laboratory Biosafety Manual.

This became important when the discussion moved from individual projects to regional expansion. If the starting point is simply the desire to establish a BSL-3 facility, there is a risk that infrastructure itself becomes the objective. If the starting point is a defined diagnostic, research, or public-health need, it becomes possible to ask whether new construction is truly the most appropriate means of providing that capacity.

Existing national or regional capacity therefore forms part of the decision. A new facility may be justified because the required capacity does not exist, cannot be accessed reliably, or needs to be available within the country. In other circumstances, strengthening an existing facility or establishing access to a reference laboratory may meet the need without creating another long-term infrastructure commitment.

Capital Investment and the Long-Term Cost of Capacity

The discussion developed Carolina's initial concern about implicit commitments and broadened it into a more general examination of how high-containment facilities are financed.

Construction and the acquisition of major equipment are usually visible components of an investment program. They have defined project costs and schedules. Many of the requirements that determine whether the resulting facility remains operational are recurring and less visible during the initial investment phase.

These include specialized maintenance, certification and verification, energy and utilities, spare parts, consumables, occupational-health programs, staff development and retention, and the eventual renewal of equipment and systems. Luis contrasted these less visible commitments with buildings, equipment, and inaugurations, which are readily identifiable and may carry institutional or political value.

The distinction matters because a high-containment laboratory may remain in service for several decades. The original construction budget represents only a fraction of the institutional commitment created by the project.

The panel discussed the difficulty of securing long-term operating resources compared with capital funding. A country or institution may be able to finance construction through a specific program, grant, or investment cycle without having an equivalent mechanism to guarantee recurring expenditure over the facility's subsequent life.

This creates a direct relationship between financing and technical performance. Deferred maintenance, unavailable spare components, the loss of specialized personnel, and uncompleted certification activities ultimately affect the institution's ability to demonstrate that containment systems continue to perform as intended.

Sustainability was therefore treated as a technical and institutional requirement as well as a financial one.

National Capacity, Sovereignty, and Regional Complementarity

The question of regional duplication evolved into a discussion in which different considerations had to be held together.

Luis introduced the importance of national autonomy in the context of public-health preparedness. The pandemic demonstrated that international access to samples, reference laboratories, supplies, and specialized capabilities cannot always be assumed during an emergency. A country may therefore have legitimate reasons to maintain national capacity even when similar capacity exists elsewhere.

Claudio's regional approach raised a different concern. Replicating specialized infrastructure across countries, or even across institutions within the same country, does not necessarily create an equivalent increase in usable capacity. If facilities lack the resources or personnel needed to remain fully operational, duplication may disperse limited expertise and financing rather than strengthen the regional system.

The discussion therefore moved toward complementarity rather than a simple choice between national and regional capacity.

Some functions may need to exist nationally because timely and reliable access is essential. Other highly specialized capacities may be maintained more effectively through reference centers or coordinated networks serving multiple institutions or countries. Luis explicitly noted that, depending on context, formalized access to regional capacity may provide greater security, better performance, and lower cost than building an additional national facility.

A regional model would, however, require reliable agreements. Sample transport, access during emergencies, financing, quality requirements, institutional responsibilities, and cross-border cooperation all affect whether nominal regional capacity can function as a dependable alternative to national infrastructure.

The panel also identified a basic information problem. Decisions about complementarity require knowledge of what capacity already exists, what functions those facilities can actually perform, and whether those capacities are operationally sustainable. Without this information, regional planning remains difficult and investment decisions are more likely to be made in isolation.

Flexibility, Future Needs, and the Limits of Generic Design

The moderated discussion introduced the problem of designing facilities whose operating life may extend far beyond the research programs or public-health priorities that originally justified them. André framed the issue through the example of a facility initially designed for tuberculosis that might later be expected to support other research programs.

Luis emphasized cost-benefit and the lifecycle of the underlying program, while considering whether facilities could retain useful diagnostic or research capacity through carefully assessed adaptation or shared use. He described an example of a stand-alone BSL-3 complex in the United States that leased suites to pharmaceutical companies, noting that such arrangements create governance questions when the host institution lacks sufficient knowledge of the activities and risks introduced by external users.

Carolina emphasized the value of strategic planning and the possibility of incorporating adaptability or modular expansion into a facility. An institution cannot predict every future requirement, but it can consider how programs may evolve and whether infrastructure can accommodate reasonable changes.

The discussion also established limits to this approach.

Claudio used a particularly concrete example: a high-containment facility designed for work with mosquitoes cannot be assumed to be automatically suitable for ticks. Processes and physical controls may differ, potentially requiring retrofitting. He extended the same argument to cell culture, mycobacteria, and different animal models. A multi-use facility therefore still depends on a new risk assessment and, where necessary, physical modifications.

He also referred to the management of suspected Ebola samples in Brazil as an example of an emergency in which existing capacity and highly experienced personnel had to be combined with modified procedures and additional protective measures, rather than assuming that an existing laboratory was automatically configured for the new hazard.

The resulting discussion did not support the idea of a universally flexible high-containment laboratory. Adaptability can be incorporated into planning, but a change in mission requires a new assessment of the hazards, procedures, personnel competencies, and controls involved.

When the existing facility does not provide the necessary controls, modifications and subsequent verification will be required before the new work begins.

Flexibility therefore has both a design dimension and a governance dimension. Institutions should anticipate change where possible, while retaining formal mechanisms to determine whether a proposed new activity remains compatible with the facility.

Personnel and Technical Competence

Questions of sustainability repeatedly returned to personnel.

High-containment capacity depends on scientific personnel, biosafety professionals, engineers, maintenance staff, and controls specialists whose competencies are appropriate to their roles. These requirements continue throughout operation and cannot be addressed solely through training provided during commissioning.

The panel discussed competence in relation both to routine performance and to institutional resilience. Experienced personnel understand the facility, its operating history, and the significance of changes in system behavior. This knowledge becomes especially important when technical problems arise or when expected resources are temporarily unavailable.

Claudio broadened the question of competence beyond laboratory operators. He specifically identified architects, engineers, managers, technical-support staff, and companies supplying critical systems as groups whose competence affects containment performance. He also advocated dedicated biosafety professionals with sufficient organizational standing to participate meaningfully in institutional decision-making.

Retention is therefore part of sustainability. Staff turnover can remove knowledge that is difficult to replace, particularly where regional pools of professionals experienced in high containment are limited.

The issue also intersects with regional expansion. Increasing the number of facilities raises demand for specialized personnel. If the professional and technical workforce does not grow at a similar pace, new infrastructure may compete for an already limited pool of expertise.

The availability of competent personnel is consequently one of the factors that determines whether nominal infrastructure represents usable capacity.

Maintenance, Verification, and Evidence of Continued Performance

Maintenance and certification served as a bridge between the discussion of long-term financing and the subsequent exchange about operational limits.

Initial commissioning establishes evidence that systems perform according to defined requirements at a particular point in time. Continuing operation introduces change. Components age, filters load, sensors drift, equipment is replaced, and maintenance interventions alter system conditions.

Maintenance, testing, and periodic certification provide mechanisms for managing these changes and demonstrating continued performance.

The panel discussion also distinguished between scheduled requirements and actual technical condition. A certification interval is an important control, but the date alone does not measure system performance. Likewise, the absence of an evident failure does not demonstrate that performance remains acceptable.

This distinction became central when the moderator asked how laboratories should respond when planned maintenance or certification activities cannot be completed.

Operation under Restricted or Degraded Conditions

This part of the session produced the clearest differences of emphasis among the panelists.

The scenarios considered included expired certification, delayed maintenance, unavailable replacement components, shortages of qualified personnel, and insufficient resources to maintain expected operating conditions. André specifically raised examples involving a lack of funds to replace filters or certify biological safety cabinets, together with the loss of critical personnel.

Luis emphasized the need for evidence of actual performance and defined institutional limits. He used the example of a biological safety cabinet whose certification had expired: whether it could continue to be used could not be answered solely by the time elapsed, because evidence of performance beyond the certification interval would be required. Similarly, he argued that a facility's operating history and test results should inform decisions about delayed HVAC maintenance.

When performance cannot be demonstrated, or when residual risk exceeds the limits the institution is prepared and authorized to accept, continued operation may no longer be justified. Luis explicitly noted that institutions must be able to say no when risk exceeds what they can tolerate.

Claudio emphasized the consequences of interrupting critical laboratory functions. He described the experience of a laboratory director in a resource-constrained country whose facility at times lacked funds even for gloves. Her laboratory could not simply close without affecting the national health system, so improvised protective measures were used while risk had to be assessed and reduced as far as possible. Claudio was explicit that he was not defending inadequate conditions; his point concerned the complexity of determining tolerable risk when interrupting an essential service also carries consequences.

He also linked tolerable risk directly to team competence and the availability of additional biosafety practices, procedures, and controls.

Carolina approached the problem through preparedness and the management system. She proposed using tools such as a SWOT analysis to identify institutional strengths, weaknesses, and dependencies, including reliance on a small number of critical individuals. These vulnerabilities can then be incorporated into risk assessment and the development of realistic controls before the adverse condition occurs.

Her emphasis was on having documented, feasible controls and defined roles and responsibilities that can help keep risk within tolerable limits temporarily until normal conditions can be restored.

The three approaches addressed different parts of the same decision. Evidence is required to understand the actual technical condition. The consequences of stopping work form part of the broader risk context. Contingency planning determines whether the institution has credible alternatives when expected conditions cannot be maintained.

The discussion also established that compensatory measures cannot justify indefinite operation under progressively deteriorating conditions. Institutions require defined limits and authority to make decisions. At some point, residual risk or uncertainty may make suspension of the affected activity necessary.

Governance, Authority, and Institutional Risk

The discussion of operational limits made governance particularly visible.

Technical personnel can identify a deficiency, measure system performance, and recommend controls. Risk assessment can characterize the consequences of different courses of action. None of these processes automatically determines who has the authority to accept the resulting institutional risk.

A participant's question about whether audits should be mandatory broadened this discussion to the relationship between external regulation and internal institutional responsibility. Carolina acknowledged the value of regulatory oversight, but emphasized that in the absence of strong external frameworks, institutions still need functioning internal management systems. She referred specifically to ISO 35001, including defined roles and responsibilities, internal audits, and the obligation to act on findings as part of continuous improvement, rather than treating auditing as a periodic checklist exercise.

Luis added that regulatory obligations also depend on the activities and agents involved. Even when construction itself is not subject to a specific authorization mechanism, work with notifiable diseases or certain pathogens may create legal and institutional obligations. He argued that governments should have clearer mechanisms for internal and external oversight and facility performance assessment.

Claudio emphasized responsibility across a broader range of personnel, including operators, cleaning staff, and technical-support personnel who may enter high-containment areas without adequate biosafety competence. He advocated minimum requirements extending from project development through decommissioning and greater competence among the professionals responsible for design, operation, and oversight.

Governance therefore connects technical performance with institutional accountability. The question is not only whether a particular control works, but how the institution recognizes changes in risk, determines an appropriate response, and maintains responsibility for the decision taken.

Responsibility across the Lifecycle

Several threads of the discussion converged on the facility lifecycle.

The original investment decision creates obligations that continue through design, construction, commissioning, operation, maintenance, modification, and eventual decommissioning. Each stage can affect the facility's ability to provide its intended containment function.

This perspective changes how initial project decisions are evaluated. Maintainability, the availability of spare parts, access to specialized technical services, workforce development, and recurring operating costs are not concerns that begin after commissioning. From the outset, they affect whether the proposed facility represents a sustainable investment.

The same applies to changes during operation. Research programs evolve, systems age, and institutional circumstances change. Evidence generated during initial commissioning cannot serve indefinitely as evidence of current performance.

Decommissioning was raised explicitly by Claudio in the discussion of regulation and governance. He noted that an institution that can no longer finance operation still has responsibilities associated with taking the facility out of service; simply stopping work does not resolve the obligations created by the facility.

The broader implication is that responsibility for a high-containment laboratory does not end when construction is complete or when the facility passes its initial certification. The investment creates a continuing institutional obligation to maintain, assess, and eventually retire the capacity safely.

REGIONAL IMPLICATIONS AND QUESTIONS FOR CONTINUING THE DISCUSSION

Taken together, the discussion suggests that the current expansion of high-containment infrastructure in Latin America cannot be evaluated simply by counting new laboratories.

The more relevant measure is the capacity those investments create and whether that capacity remains available over time. This requires attention to the relationship between actual laboratory demand and new investment, the distribution of specialized functions across the region, long-term financing, workforce development, technical maintenance, and institutional governance.

The panel also identified areas in which continued regional work would be useful. A clearer picture of existing high-containment capacities would support better decisions about gaps, duplication, and complementarity. Greater attention to lifecycle cost could improve investment decisions before institutions assume long-term obligations. Development of the regional technical workforce will become increasingly important if infrastructure continues to expand.

Operational decision-making under restricted conditions also warrants further examination. Laboratories need credible approaches for assessing continued performance, applying temporary compensatory controls where appropriate, and defining the conditions under which work must be restricted or suspended.

The discussion also pointed to the need to strengthen professional and regulatory capacity around high-containment infrastructure, including competence among laboratory personnel, biosafety professionals, engineers, architects, technical-service providers, and institutional decision-makers. Claudio especially emphasized the need for minimum frameworks extending across the full facility lifecycle, while Carolina and Luis addressed complementary roles for internal management systems, institutional oversight, and external regulation.

None of these questions has a single answer applicable to every country or institution. Latin America presents substantial differences in public-health needs, research priorities, technical capacity, regulatory structures, logistics, and available resources. Luis specifically cautioned against treating the region as a homogeneous risk environment.

The panel did not seek to establish a single model for the expansion of high-containment laboratories in Latin America.

It provided a basis for examining the decisions that precede construction, the commitments created by those decisions, and the conditions under which new infrastructure becomes sustainable scientific and public-health capacity.

The questions raised during this first session will continue to inform BioLab's Biosafety in Latin America panel series.

A REGIONAL CONVERSATION

BioLab Solutions thanks Carolina Becerril Esquivel, Claudio Mafra, and Luis Ochoa Carrera for contributing their knowledge, professional experience, and different perspectives to this discussion.

We are especially grateful to André Mendonça for moderating the panel and preparing the interpretive commentary included in this publication. His reflections extend the value of the original exchange by identifying the broader questions and institutional implications that emerged from the conversation.

We also thank the professionals who participated in the live session. Their questions, observations, and examples broadened the discussion and demonstrated the value of creating spaces in which people from different countries, institutions, and professional fields can examine regional challenges together.

BioLab Solutions is responsible for the synthesis and editorial framing of the publication. André Mendonça is responsible for the interpretive commentary published under his name.

BIOLAB SOLUTIONS PANEL SERIES

Decision-Making in Biosafety creates spaces to discuss questions that cannot be resolved through technical guidance alone. The aim is not to produce artificial consensus, but to improve the quality of the questions, make visible the assumptions behind familiar approaches, and strengthen an integrated understanding of how biosafety capacity is created and sustained in practice.

CONTINUING THE DISCUSSION

EThis document records and synthesizes the principal ideas that emerged during the first panel in the Biosafety in Latin America series: decision-making, governance, and long-term capacity.

This is the first of three panels conceived as an open and cumulative conversation. Subsequent sessions will revisit some of the questions raised here, incorporate new perspectives, and broaden the discussion of biosafety and biosecurity challenges in the region.

Share Your Comments and Questions

We welcome other experiences, disagreements, questions, and topics that you believe should be incorporated into this conversation. You may send your comments through BioLab Solutions or use them as a starting point for future discussions with colleagues and work teams.

Explore the Full Series

Visit our website to access:
the complete recording of this panel;
upcoming panels in the series;
synthesis documents and supplementary materials;
related references and resources;
new publications arising from the discussion.

BioLab Solutions Panel Series

The conversation continues.



BioLab Solutions
biolabsolutions.com.mx
contacto@biolabsolutions.com.mx

THE MEASURE OF EXPANSION

IT IS NOT THE NUMBER OF LABORATORIES BUILT.

It is whether those investments create capacity that remains safe, functional, technically competent, and available when needed.

This publication brings together BioLab Solutions' synthesis of the first panel in the Decision-Making in Biosafety series and the interpretive commentary of moderator André Mendonça.