

DR. VELEZ DE BERLINER: Thank you very much. It is a pleasure to be here and I am very honored. I am not a scientist. I am a practitioner of research, analysis, and design of unknown risk-mitigation strategies.

Excellent presentations have been made today, and particularly the one that we just heard from Suzanne about what to look for about risk and all the factors that contribute to it. It was an excellent presentation. That is what I call Plan A - the risk that is more common to you; the one that you have in front of you; the one that you deal with day in and day out. It is in your DNA as a researcher, as a manager of research; it is part of you.

The risk that I focus the most on, the one my experience of about 30 years doing international work shows me is crucial, the one I have learned by trial and error, is the risk that I am not looking at right now, the unknown risk that, eventually, is going to come and bite me. That is the risk my clients and I know is the one that consumes an unnecessary amount of money, time, and energy when it hits, seemingly out of nowhere, and, yet, it was lurking in the background. Its consequences are often almost irreparable. I look at these risks not so much from the technical standpoint because the technical things, the equipment, the research design, the protocols and objective - those are in front of you. You know them, or you should know them.

Drivers (causes) are what I look at - unknowns in the world outside - that are going to impact what I am doing. I divide them into political, economic, social, and cultural drivers. Nothing is local anymore. We live in a totally interconnected, intercommunity world. We may think that we are in our cubicle, or in our government office, or we are looking at the Washington Monument, doing something very local, but that locality operates and functions within a global environment. No matter how private or personal or sacred or classified what you do might be, it will eventually be flipped by the government to private industry, such as DARPA, or it will go from industry to the government, or from your garage, dorm, or basement to the government/industry complex – or it may die because you did not think about what could go wrong; your unknown risks.

Here are the drivers.

### ***Political Drivers***

Americans, and I hope I do not offend anybody - I am an American citizen born in Colombia - we love our assumptions. We have a very good basis to make those assumptions. There is no democracy like ours, but that is an exception, not the rule. I am not going to argue with people here from the Department of State who might believe an election a democracy makes. Not all democracies are alike. As a matter of fact, they are very different.

When you go and do your research, particularly when you are looking at an international collaboration, you are highly probable thinking your work will be done in a country with a democratic government. However, democratic governments outside the US, and even inside the US, have a proclivity to interfere with, control, direct, or influence research, particularly research collaborations across borders. Governments will regulate the scope and protocols of your work, if the research you do is related to atomic weapons, genetics, biochemistry, bioethics, human health or the use of human subjects, the use of laboratory animals, agriculture, the environment or the exploitation of natural resources. Also, if the research might be politically threatening, it will not happen – or its results may be secreted for years, or destroyed.

One key political driver to consider is that, although some governments have national legislation and regulations, these may be enforced differentially at the state and municipal levels.

In some countries, provincial or state regulations have more weight than they would have at the national level because governors or provincial leaders influence congressional and senatorial delegations, thus controlling the voting blocks that enact laws and regulations.

Don't forget, the country where your research collaboration takes place may have a president, or whatever title the leader holds, but there is a regulatory body that is going to establish what you investigate, how you investigate, how you can report it, to whom the report goes, and who the ultimate user of the research findings and/or recommendations will be, and how, when, and where they will be implemented.

When I work with clients, I first look at where the research is going to be done, and where the research might end up. I help the client look at the political arena and how its sands might shift, under what probable circumstances, how, and to what degree the shifting will affect my client's research funding and direction.

### ***Economic Drivers***

I don't know if it is still true that we are the most economically powerful country on Earth – I doubt it. But what I do know is that this Latin American saying still holds true: "He comes up with the money dictates the conditions of the bargain." Therefore, once research collaboration crosses borders, it is imperative to know, who is funding your research? Is it government? Is it industry? Is it industry in connection with the government? How are future events in the economic world environment going to affect the funds that support your in-country research and abroad? What would the effect and affect of world economic conditions be on your research? Who could or would influence those probable occurrences or outcomes? What could change and what would the magnitude of change be – at the governmental and industry level?

Tying those together - elections have consequences. Those consequences turn into the regulatory environment that those elections create, and how the economy is going to impact that regulatory environment.

When I deal with clients who have encountered trouble overseas, I find they did not look at the regulations they encountered and what those regulations meant within the in-country legal environment. Most often, the client interpreted the regulation from a US-centric perspective. The client also overlooked the regulations that might have been coming “down the pike;” regulations that were headed in the client’s direction, but that the client chose to ignore. Worse the client believed the regulations would not have applied to him or her. It is into this area of the unknown regulatory environment that you need to look to preclude surprises that might derail your research.

This is a futuristic way of looking at risk. It may happen. It may not happen. But if it happens, you are going to be prepared.

### ***Social Drivers***

Researchers can’t afford to overlook how politics and economics affect and shape the social environment, particularly in one area we have focused repeatedly: education, education, education. The quality, not the quantity, of education is crucial to those who do business internationally, particularly in technical areas and research collaboration.

Speaking of education, it is worth noting Latin America was not included in the conference. I think this lack of inclusion is due to the fact that, as I see it, and with very few exceptions, Latin America is cutting its own throat by not focusing and putting emphasis on high-level, world-quality technical and scientific education, accessible to a broad range of its population. The short supply of these two, if not remedied, will continue to undermine the sustainable future of Latin America

There is plenty of money in Latin America to fund research. If I am going to give you a takeaway here, look at countries such as Brazil and Colombia, where there is a lot of foundation money looking for research, researchers, technology, the educational and training capacities that are represented here to help Latin America develop the human and research capital it will need in the future.

However, if you decide to go to Latin America and also into Africa, don’t overlook the dragon, meaning China.

China has so far had a Mercantilist approach to investment in Latin America, but the day is not far into the future when China is going to begin funding research in Latin America. Chinese competition or collaboration from Latin America is going to come to you sooner rather than later. As I said before, he who comes up with the money dictates the condition of the bargain, and the US is funding few

research projects in Latin America, if at all.

One of the things that we, as Americans, need to do in looking at our technical and research vulnerabilities is not to assume that, yes, we are the leading research center and the leading depository of science in the world. We are not going to be that forever. Face it: We are broke. Unless something is done so that we recover economically and more money is dedicated to funding research, our research leadership will be affected, with heavy societal losses.

### ***Cultural Drivers***

When it comes to culture, culture gives every country the government it deserves. We could sit here and debate that forever, but culture determines the type of government, the type of legislation, the type of society, they type of societal arrangements that are going to support the research the society needs, the research that society demands.

If you cannot have a total understanding of that culture, you are not going to be effective as an international research collaborator. The success or failure of international collaboration, something that has been said all day today, hinges on the researchers' understanding of the culture in which they do their work. You have to understand the culture, but, please, let us not understand that culture from our perspective. Our understanding must be based, and guided by, the understanding the researcher's counterpart has of his or her own culture.

I hope I did not offend anybody. I am very proud and very grateful that this country allowed me the privilege of becoming a U.S. citizen. Not every citizen of the world can be an American citizen. They have different perceptions. They have different expectations. They have different realities. Culture needs to be understood from those realities. When you try to do work with a different culture, put your assumptions away. Listen and look to understand the culture. If you are an anthropologist, I am sure you have done field research abroad. Listen and look because the most effective way of communicating in the world is through what - actions. Look at the actions. Look at how your collaborators are acting and listen to what they are saying. Look for the coincidences, the compatibilities. Look for where words and actions match; look for their dissonance, for their discrepancies and contrasts – these are the red flags you can't afford to overlook.

When I deal in an international situation, particularly in a contract negotiation, I place close attention to who goes to the table, who enters the room first, who sits where and in which order, who talks to whom, and their facial expressions and body language and what they mean in their culture, not mine. The rank sitting they take tells me who is the person in charge, who is the person that is going to

sign the contract or influence the negotiating process to the point of acceptance or denial of the contract.

I beg to disagree with the statement made this morning that you can sign a contract in China, walk out with your piece of paper, and be happy go lucky and on with your research. My suggestion is don't traipse into China or into Brazil or into Colombia, Argentina or Chile, not even into Europe, with a little piece of paper unless you know without a shadow of the doubt how that contract is going to be enforced in your foreign jurisdiction or how that contract is to be read by a foreign court of law, if it has to get to that point.

Remember, once you are outside the US, a collaboration agreement, a partnership, a joint venture agreement has an implied labor contract embedded into it, whether labor rules and regulations are written into the contract. A handshake is not a contract that holds up in court. It may be very nice; it may be wonderful; it may make you feel terrific that, in this day and age of permeating distrust, you can conduct your research collaboration on this trust-based manner.

Instead you should always ask, what could go wrong? What is the worst that can happen here? What unknowns do I need or should I consider? This is not easy to do because every day in our business, in everything, we are conditioned to look at what is going on in front of our eyes and from our limited perspective. However, any company, any research manager has the obligation to step back, or to designate a person, to ask at all times: What can go wrong? What is the worst that could happen?

What can go wrong can be specific about something, but nothing is separated from the whole. If something can go wrong at a given time of the research process and in a given area, whatever happens does not occur in a vacuum; it will be connected, interlinked, to something else. How will the possible or probable consequences of "this interlinking" affect the future of the research?

As researchers, our crucial responsibility is to ask and respond to, what is the worst that could possible happen? How can I prepare for it specifically? What are the specific actions that need to be taken if "this" happens? You may say, "That is paranoid." My experience enables me to disagree. Paranoids are right sometimes; so keep that in mind.

Paranoia aside, focusing on what can go wrong, on the worst than can possibly or probably happen, has a tremendous positive advantage: the opportunities you discover by focusing on what might be wrong, on the worst that could happen. Opportunities for an expansion of the research, for a correction in the research or for future opportunities to secure funding. In the end, money is the mother's milk of everything that we have been discussing here. If the funding is not there, then research is not going to be.

When I work helping people secure funding, I always look at the fundamentals of

their project, but I also ask the hard question: Why are they not telling me what can go wrong, what is the worst that can happen, and how are they prepared to overcome the “unexpected”? I must know how they are prepared for the downside before I consider funding.

My parting words are this, good luck. Look at what may be coming “down the pike” because it pays to predict the unknown, because the unknown may happen. You can ill afford to be found unaware of it.