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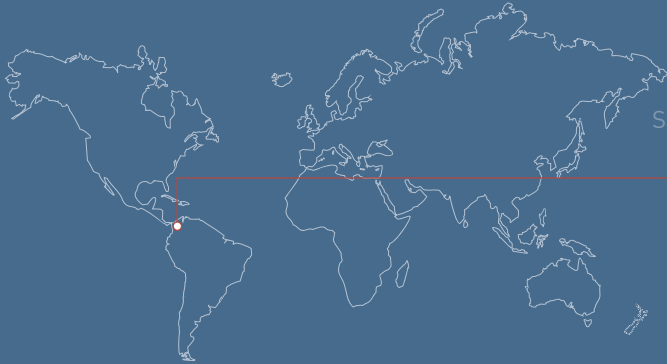
Aquaculture Insurance (Victoria Alday).

Shelter from the Storm (Anna Hargis).

Dr. Luis Izquierdo: "Medical Genetics and Insurance".

Ghislain Laurent: "Living reinsurance from Brussels".





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## trébol

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## editorial

With the eagerly-awaited Northern summer just around the corner, we have pleasure in presenting issue 53 of Trébol. This new release covers several very different areas of interest but as ever, all of them are subtly linked to our core activities of insurance and reinsurance.

Aquaculture, which is the breeding of aquatic species in captivity, is a segment that will help to meet the demand for food from this source, given that hauls of wild-caught fish have reached their upper limit. Many aquaculture farms are set up as high-tech enterprises involving major investments, so they call for insurance which usually combines damage and sickness cover. Victoria Alday, a veterinary surgeon and doctor of aquatic pathology suggests that in order to cover the bio-health aspects, we should follow a risk evaluation protocol for diseases in aquatic animal breeding centers; details are given in this issue.

From Missouri in the USA, the staff of Shelter Insurance tell us that they understand storms. The firm's geographical business scope includes areas that are hit by 90% of all the tornados that occur in the world, and they also have to cope with hurricanes. However, Shelter has decided to improve the professionalism of its catastrophe management, which enables the company to provide clients with the services promised by the agents when the policies were sold. Anna Hargis, Director of Advertising, describes the technology in which Shelter has invested to improve its claim management, as well as the methods used to evaluate the effectiveness of its procedures. Among many other benefits that clients have enjoyed, Shelter was one of the few companies not to be sued by insureds due to the chaos following Hurricane Katrina in 2005.

Our genetic inheritance is our "ID card", and medical genetics is the science that deals with the diagnosis of hereditary illnesses. Dr. Luis Izquierdo, a specialist in this field who holds a masters in medical genetics from the University of Glasgow (Scotland), confirms that it is impossible to reverse the action of a gene in a human being. With early identification, however, it is feasible to prevent a person from suffering the consequences of an illness of this sort thanks to simple lifelong treatment.

Ghislain Laurent, Director of the MAPFRE RE office in Brussels, says that 35 years in the reinsurance business have been more of a way of life than a job. Like all seasoned professionals, he has come through the crises that have hit the sector in recent years, but he describes them as "challenges" and sees them as sources of "motivation" to get the industry back on track for business growth. With the same thirst for knowledge and interest in understanding the international dimension that have been the hallmarks of his career, Ghislain is retiring this June to travel the world and take occasional breaks on the French Riviera. On behalf of Trébol, and with our thanks for your constant generosity, we wish you all the best for your new travels.



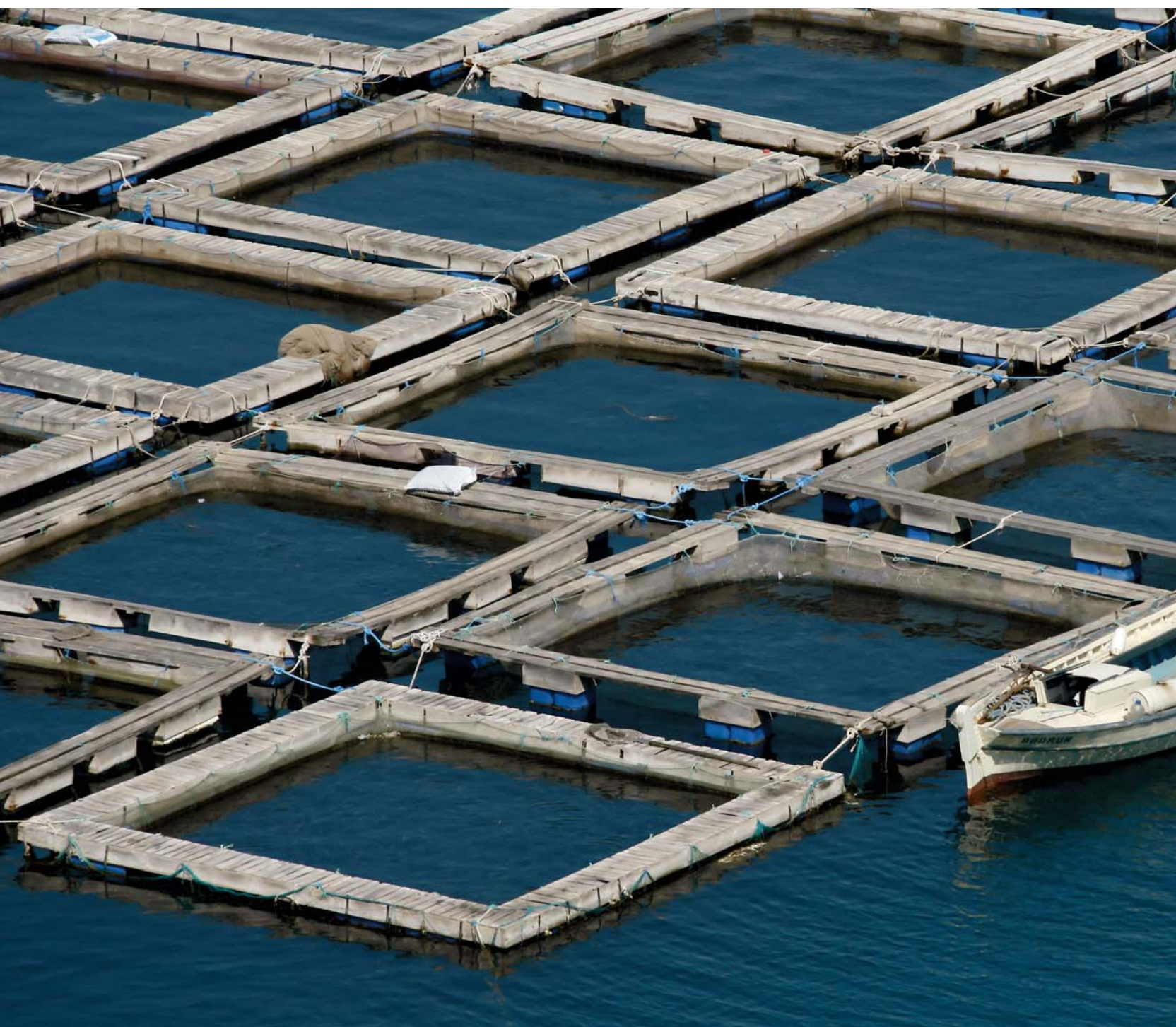
# Aquaculture Insurance The Need for Evaluation of Disease Risk for the Sustainability of a Company

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Victoria Alday

D.V.M. University of Zaragoza, Spain

M.Sc., Ph.D. University of Stirling, UK

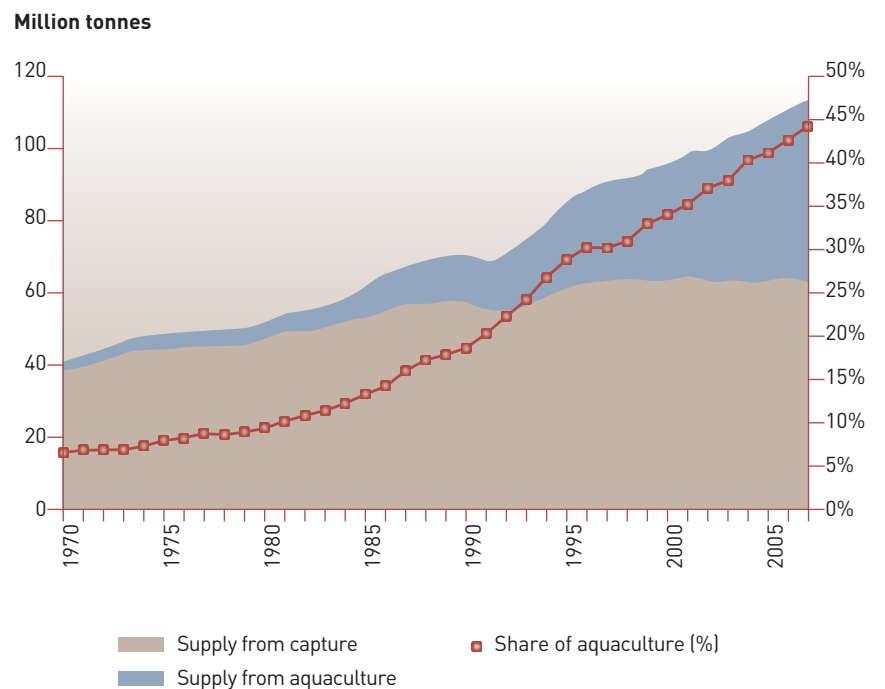






Aquaculture is the fastest growing food-producing sector, increasing its overall global output by about 10% annually for the last two decades. It currently accounts for almost 50% of the world's seafood, and it is widely agreed that has the greatest potential to meet the growing demand for aquatic foods (figure 1).

**Table 1. Contribution of aquaculture to food-fish supply**



**Disease is understood as a production cost so proper sanitary management is crucial to a sustainable and profitable business**

Given the projected population growth, it is estimated that aquaculture will produce 85 million tons of aquatic food by 2030, an increase of 34 million tons over the 2006 level (Food and Agriculture Organization of the United Nations, 2006). This means that that by 2030, there will be more fish for direct human consumption from aquaculture than captured fish, Aquaculture clearly has an important role filling the gap between sustainable wild fisheries supplies and the growing seafood demand.

## Diseases in Aquaculture

Diseases are a constant if not altogether routine aspect of livestock rearing and as such we often find them in aquaculture. Aquaculture has gone through an intense learning experience in a very short period of time. Over 300 different species are cultured, under a wide range of environmental conditions. This requires the optimization the environmental conditions, nutritional requirements, identification of pathogens and implementations of disease prevention measures. Once the culture conditions have been set, health becomes a measure of productivity. In other words, disease is understood as a production cost and therefore proper sanitary management is crucial to a sustainable and profitable business.

Losses due to diseases can be divided in two main groups. Firstly the ones due to acute mortality or caused, often, by known pathogens and secondly those caused by poor survival, often not understood but still expected. Precise per annum figures of consequences of disease losses are difficult to pin-down, but some estimates are available (Table 1). These figures have been obtained during periods when the industry was affected by acute epidemics, mainly due to viral diseases. However, losses due to chronic diseases, poor survival and low performance are not considered as a disease problem but a production cost. The cost of these types of diseases is likely to surpass the cost of the acute ones. A global estimate of disease losses to aquaculture by the World Bank in 1997 was in the range of USD 3 billion per annum.

Minimizing these losses is one of the key factors for a sustainable business.

## Assessing Risk of Disease

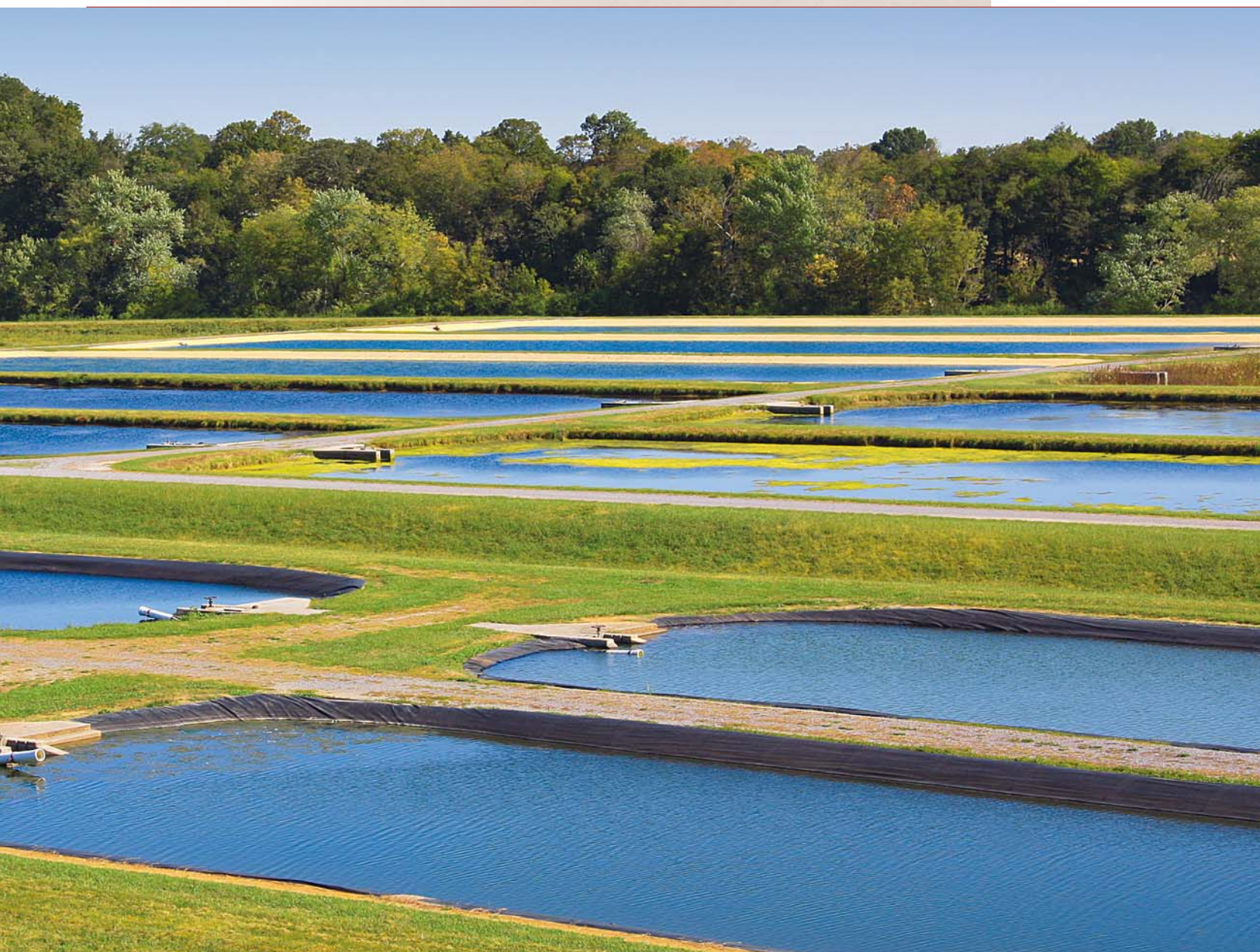
As mentioned before, diseases are part of any animal production system. Reducing their presence or their impact is part of a risk management strategy that would take into account the present health status of the animals in the facility and neighboring area, the technical level of the on-farm staff, the legislative frame of the country and region, its





**Table 1. Estimated losses due to some selected diseases in the aquaculture industry in recent years**

Region	Disease	Years	Estimated Losses (USD)
Asia	Epizootic Ulcerative Syndrome	Before 1990	Over 10 million
Western Europe	Viral Haemorrhagic Septicaemia Virus	Annually	60 million
China	White Spot Syndrome Virus	1993	250 million
India	White Spot Syndrome Virus	1994-1995	17.6 million
Malaysia	White Spot Syndrome Virus	1995-1999	25 million/year
Bangladesh	White Spot Syndrome Virus	1995	10 millions
Thailand	White Spot Syndrome Virus	1996	210-250 million
		1997	600 million
Ecuador	White Spot Syndrome Virus	1999	280.5 million
		2000	400 million





diagnostic capacity and access to health management expertise, and the biosecurity plan for each facility. Table 2 refers to each of these parameters in detail and provides a score system in an attempt to quantify the relative importance of each of them.

### Present health status of the facility and disease records of the last 2 years

Obviously, the present health status of the animals at the time of purchasing or renewing an insurance policy is of great importance, but the disease records of the previous two years are still more important. The expression of the disease of some pathogens is seasonal. They can either cause outbreaks during the cold weather -such as White Spot Virus in shrimp- or during the warm weather as *Streptococcus* in fish.

Pathogens can be classified as primary or secondary pathogens. The formers are those that can cause disease by themselves while

the latter or so called “opportunistic pathogens” need to have an underlying situation (poor environmental conditions or a primary pathogen) to be able to cause disease. Primary pathogens that have not been detected within the last two years and have been under surveillance during that period of time may be considered absent or eradicated. Diseases caused by opportunistic pathogens require the investigation of the primary cause which often is related to poor health management of the animals. Once these conditions are corrected, the disease problem will disappear.

Not all pathogens have the same impact and not the same weight should be placed to combat each of them. Pathogens vary in terms of severity of the symptoms, including mortality and their means of transmission (particularly vertical transmission), possibility of exclusion, treatment or vaccination. Therefore, the detection of each specific pathogen in a facility should be evaluated in terms of risk to production .

**The compulsory reporting of diseases outbreaks and the isolation of infected facilities may prevent further spread of the pathogen**



Salmon farm



**Table 2. Disease risk evaluation tool for insurance underwriters. The higher the score the lower the risk of disease outbreak and spread in the facility. It is difficult to define the minimum score for an acceptable level of risk. Disease risk is one more factor in the decision to grant insurance coverage.**


	<b>Issues</b>	<b>Scope</b>	<b>Possible score</b>
1	Present health status of the facility	Presence and type of primary pathogens. Possibility of treatment or vaccination.	0-5
2	Disease records of the last 2 years	Diseases caused by opportunistic pathogens would imply poor health management.	0-10
3	Capabilities of on-farm staff	Capacity to spot possible and potential health problems. Field diagnostic kits on site.	0-5
4	Disease status of the neighboring farms and country	Check World Animal Health (OIE) and scientific and popular literature.	0-3
<b>Legislative frame</b>			
5	National legislation on disease prevention and control	To prevent the introduction of pathogens into a country or their spread.	0-10
<b>If not</b>			
5.1	Restriction on the importation of live aquatic animals	Ban of importation from countries of lower sanitary status or request of health certificates .	0-5
5.2	Regulation on the effluents and waste from aquatic animals processing plants	Avoid the release of pathogens into the natural environment and the posterior infection of farmed stocks.	0-1
5.3	National reporting and isolation of infected facilities	Early warning system, isolation of infected facilities and national contingency plans.	0-3
5.4	Existence of a National Diagnostic Reference Laboratory	As a support and control the quality of private laboratories. Updated on exotic and emerging diseases.	0-1
6	Regional harmonization	Among neighboring countries to prevent the pathogen introduction.	0-1
7	Facility under certification program	Although mostly focused on environmental, organic and social issues, they include good aquaculture practices.	0-3
<b>Diagnostic capacity (available techniques)</b>			
8	Histology based methods	Low sensitive technique for disease (endemic or exotic) outbreak diagnosis and detection of new pathologies.	0-3
9	Polymerase Chain Reaction PCR (molecular methods)	Highly sensitive technique for known pathogens detection: surveillance and screening of broodstock and offspring.	0-4
10	Evaluation of diagnostic quality	Operation under international standards, participation in ring tests, academic level of staff, regular calibration equipment.	0-2
<b>Biosecurity</b>			
11	External biosecurity	Presence of physical barriers, restriction of incoming vehicles and visitors, water filtration.	0-3
12	Surveillance of wild animals	If sub-clinically infected, result in the transmission of pathogens to farmed animals.	0-2
13	Introduction of live aquatic animals into the facility	The source of the animals (eggs, broodstock or larval stage) and health certificates need to be evaluated.	0-2
14	Internal biosecurity	Health management program in place together with a contingency plan.	0-4
15	Regular surveillance of farmed animals	Detect presence and increase of prevalence of pathogens forecasting possible epidemics.	0-3
<b>Total score</b>			<b>0-60</b>

## Disease status of the country, legislative frame and regional harmonization

A well developed national legislation may prevent the introduction of pathogens into a country or their spread within the country. The new European Union Directive 2006/88/EC that was enforced in 2008 provides the most complete legislative frame for the protection of aquaculture production. Other countries are already working on the harmonization of their laws using the European one as the reference. It should always be taken into account that while having a suitable legislation is important, its implementation is crucial for its success. The degree of implementation of legislation varies greatly between countries and often, developing countries, where most of the aquaculture production takes place are deficient the resources for implementation.

An efficient legislation in terms of disease prevention and control needs to take into account four major issues.

1. The restriction on the importation of live aquatic animals as the movement of live animals is the most efficient way of introducing pathogens. Apparently healthy animals may be carriers of pathogens that can be passed on to populations of different susceptibility. The ban on the importation from countries with lower sanitary status or the request of reliable health certificates may help to control the introduction. An example that proved the efficiency of such legislation was the introduction of WSSV disease in Philippines. In the early 90`s, the WSSV pandemia affected every shrimp producing country in South East Asia. Philippines reacted very quickly to the first WSSV outbreak in China by imposing a ban on the introduction of live shrimp. Such a measure prevented the introduction of the pathogen till 6 years later when live animals were illegally introduced into the country and together with the shrimp, the pathogen.
2. Effluents and waste from aquatic animal processing plants need to be regulated to avoid the release of pathogens into the environment and later re-infection of farmed stocks. This is one of the hypotheses of the introduction of WSSV into America. Large amounts of frozen shrimp from Asia were introduced into Latin America for further processing and in the 90's.



Processing plants were placed near aquaculture production areas and solid wastes and effluents were released directly into the environment which is likely to have resulted in the release of the pathogen into the environment.

3. The compulsory reporting of diseases outbreaks which are considered relevant for the industry and the isolation of infected facilities may prevent further spread of the pathogen and minimize the loss for the industry. The earlier this is done, the easier to control the spread of the disease.





4. The existence of a national reference diagnostic laboratory will support private labs on the quality of their methodology and results and will be updated on exotic and emerging diseases that will facilitate a quicker response.

Having knowledge of the disease status of the country is also relevant due to the continuity of the aquatic bodies as pathogens do not recognize private properties or boundaries. Often, it is a matter of time that the disease problem of "the neighbor" becomes ours as

well. The same happens with neighboring countries and the risk of disease transfer will depend on the type of pathogen and mode of transmission.

### Certification schemes

There are a number of certification schemes to comply with certain production standards and product quality. Production standards (best management practices) deal mostly with sustainability, environmental and social impact (Global Aquaculture Alliance, GlobalGAP or WWF). Quality product programs deal mostly with organic labels (Naturland or IFOAM) and gourmet products (Label Rouge for France and UK; Guaranteed traditional specialty for Italy and Greece, or Thai Quality Shrimp).

It is now widely recognized that the implementation of better management practices in farming can bring significant improvement in production, reduction in the outbreaks of disease due to secondary pathogens and increased product quality. But none of these certification schemes specifically cover the area of disease prevention, and therefore complying with these programs do not insure reduction or minimization of losses due to diseases caused by primary pathogen, the ones responsible for catastrophic losses (i.e. such as the recent crisis of Infectious Salmon Anemia of salmon in Chile).

### Diagnostic capacity

The diagnostic capacity of a farming facility - or its access to it - is of crucial importance for a speedy response to a disease outbreak. There are different techniques that vary on sensitivity and specificity and their application should depend of the purpose of the test. In the case of disease outbreak, low sensitivity test should be used such as histology that permits to confirm that the lesions are caused by the particular pathogen. In the case of screening or detection of pathogens in the absence of clinical signs, a highly sensitive method such as PCR is necessary to detect them. Evaluation of the quality of these diagnostic laboratories and procedures is highly relevant. There are some operating standards such as EN ISO/IEC, EN 45002 or EN 45003 that facilitate this task as well as the participation in ring tests.

**Aquaculture insurance considers the present health status of the animals but the disease records of the previous two years are still more important**

## Biosecurity of the facility

Biosecurity broadly describes the process and objective of managing biological risks in a holistic manner. Identification of the risks can be done from two perspectives, risk coming from the outside: bioexclusion (dealt with by external biosecurity) and risks spreading within the inside: biocontainment (dealt with by internal biosecurity). The principles of biosecurity can be applied to each of the different production species and systems whether they are intensive or extensive, but the implementation of biosecurity measures needs to be defined for each of these cases.

The main activities within external biosecurity involve the control in the introduction of live aquatic animals into the facility whether they are eggs, broodstock or larval stages. This is the most efficient route of pathogen introduction. Introductions should only be carried out after the acceptance of a reliable health certificate. The surveillance of the health status of wild animals from the surrounded areas may provide information on future risks faced by the facility. The effectiveness in the use of physical barriers, restriction of incoming vehicles and their disinfection, water filtration or recirculation or use of crab and birds fences need to be evaluated.

The main activities within internal biosecurity involve the active surveillance of farmed animals to determine their health status and possibly detecting emerging disease problems at different developmental stages. The compartmentalization of the production units together with restriction of staff movement and routine disinfection are examples of the control of spread of pathogens within the facilities.

As part of the biosecurity plan, each facility needs to have a contingency plan. The objective of a contingency plan is to recover the standard production in the minimum time, at the minimum cost and with minimum disruption after a disease outbreak. Short recovery and effective control is linked to rapid initial response and rapid, effective implementation of biosecurity measures



**External biosecurity involves the control in the introduction of live aquatic animals into the facility whether they are eggs, broodstock or larval stages**





Trout aquaculture

## Conclusions

Assessing the risk of disease would allow anticipating possible disease outbreaks and the subsequent production loss. It can also help to identify the weakness of the production system from the sanitary point of view.

Assessing the risk of disease and potential economic losses in an aquaculture facility is possible and necessary. By doing so, the insurance company can help the aquaculture facility to revise and often improve their health management strategy ensuring its sustainability.

**Acknowledgement:** The author wants to express her gratitude to Dr. Darryl Jory for the edition of this document.

Further information can be found at:

Global Aquaculture alliance  
<http://www.gaalliance.org/>

Naturland  
<http://www.naturland.de>

ISO - International Organization for Standardization  
<http://www.iso.org>

IFOAM - International Federation of Organic Agriculture Movements  
<http://www.ifoam.org>

Food and Agriculture Organization of the United Nations (FAO)  
[www.fao.org](http://www.fao.org)

GlobalGAP  
<http://www.globalgap.org>

WWF - World Wildlife Fund  
<http://www.worldwildlife.org>

# Shelter from the Storm

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Anna Hargis

Director of Advertising Shelter Insurance Companies, Missouri (U.S.A.)







Employees and agents at Shelter Insurance® understand storms. Dealing with claims and helping customers after a catastrophic event is part of the Shelter Insurance group of Companies' foundation.

That fact has helped build Shelter from a small insurance company founded in 1946 to a well-respected regional insurance group recognized for its financial strength and stability. The Ward Group® recently ranked the Shelter Insurance Group (Property and Casualty) for the second year in a row among the top-50 performers out of more than 3,100 U.S. Property & Casualty insurers. The group and the Shelter Life Insurance Company were both recognized as one of the top 50 safest and best managed companies in the industry.



Claims Catastrophe Vehicle, Oklahoma (2009)

**90% of the earth's  
tornados occur  
within the Shelter  
Insurance®  
operating territory**



**The vans can be used as communication centers for customers and allow claims adjusters a base for field operations**

During the past decade, the Shelter team has dealt with a myriad of catastrophic events ranging from hail storms to hurricanes. Shelter insures property and casualty risks in fourteen of the United States that reach from the Gulf of Mexico to the Colorado Mountains and the Nevada desert. One interesting meteorological fact is that 90% of the earth's tornados occur within the Shelter Insurance® operating territory. Employees and agents frequently monitor weather reports, watching the skies with a wary eye.

"The past two years we have experienced strong storm activity in many parts of our operating territory," reports Vice President of Claims Matt Moore. "We are handling storm claims at unusual times during the year, including through the winter months, and that can strain our resources. I continue to be impressed by the hard work and dedication of our claims team, especially those first-responders to catastrophic situations."

One way the Shelter Claims team has dealt with the constant battle between rising costs and controlling expenses is to invest in technology. A project to streamline the claims adjusting process led to a system called the "Claims Workstation System" or CWS. This allows electronic processing of claims forms





New Orleans flooded by hurricane Katrina

This article is authored by Anna Hargis, Director of Advertising for the Shelter Insurance Companies. Ms. Hargis has held this position for 11 years and prior to joining Shelter Insurance®, spent 11 years in television marketing and promotion with the local NBC affiliate in Columbia, Missouri. She is a member of the Columbia Chamber of Commerce and is active in the Chamber Ambassadors program as well as Women's Network. She volunteers with the Internet Citizen's Advisory Group for the city of Columbia. She received a Bachelor's Degree in Journalism and a Master of the Arts Degree in Communication both from the University of Missouri. She resides in Columbia, Missouri with her husband and son.



Ice Storm in Springfield, Missouri (2008)



Tornado near Kearney, Nebraska (2008)

and has significantly decreased the reliance on physical paperwork and allowed the claims department to process claims faster without expanding the existing staff. "This new technology is allowing us to better focus on our customers' needs. Providing outstanding customer service is the most important thing we do. We want to deliver the promise we made when our agents sold our customers their policy." Mr. Moore said.

**“We want to deliver  
the promise we  
made when our  
agents sold our  
customers  
their policy”**



In 2005, Hurricanes Katrina and Rita devastated a large section of two states that Shelter serves. Louisiana and Mississippi residents faced storms of epic proportions that left entire areas buried in debris. The Shelter Catastrophe team mobilized and immediately began taking care of customers. They dealt with the humanitarian effort by providing food, water and emergency funds for policyholders displaced from their homes.

Whether it was helping homeowners find ways to cover the holes left in roofs or providing safe food and water to hungry families, Shelter employees and agents worked with emergency responders after the hurricanes. The employees and agents were also deeply affected by the stories of loss. One customer visited the Shelter emergency claims site soon after the storm. He joked with staff members about not even

being able to brush his teeth for days, but remained in good humor about the situation. Unfortunately, staff members learned that the customer suffered a heart attack and died a few days later while trying to take care of property damage. While roofs can be repaired and trees replanted, the human toll of the storms is the most difficult challenge to accept.

The aftermath of the hurricanes was a time of change for Shelter's Claims department. While Shelter was one of the few insurance companies that were spared the high-profile consumer lawsuits and complaints after the hurricanes, the claims leadership team believed it was an opportunity to evaluate overall effectiveness of their processes. The CWS project moved forward at a rapid pace, and the group evaluated options for improving communications and outreach to customers





following catastrophic events. This effort led to the recent acquisition of three large vans equipped to quickly travel to storm sites. The vans can be used as communication centers for customers and allow claims adjusters a base for field operations. "The mobile Storm Response Vehicles have become a valuable tool for our claims team," Mr. Moore added. "These vehicles feature designs that identify them as Shelter Storm Response vans and our customer feedback has been very positive." The company originally purchased three vans, and will evaluate the need for additional vehicles in the future.

In 2009, the Shelter Claims team has again faced record number of storm claims. Hailstorms, tornadoes, and high winds have caused extensive property damage in nearly every state in Shelter's operating territory. The Com-

### Storm claims for the last 5 years







Blizzard, Washington D.C.

panies have remained financially strong through this challenging time due to on-going conservative fiscal practices.

One of those practices has included something unique to Shelter's balance sheet. The Companies established both an earthquake reserve and a catastrophic weather reserve several years ago, which while more conservative than other companies is an acceptable financial practice under the law. These reserves are funded through a portion of the premium collected from each property policy and are used under very specific financial conditions. The earthquake risk to the operating territory is through the New Madrid fault line, which continues to generate earthquake activity since the catastrophic event that made it famous more than one hundred years ago. Shelter has not had to tap into the special earthquake reserve since establishing it; however the severe weather fund has been utilized.

The Claims leadership team recently developed a training program designed to teach leaders in other departments throughout the Companies about the Shelter claims process. The two-day Executive Development seminar was presented to Directors and Managers from other departments. The auto and homeowners' policies were reviewed and the departmental structure was explained in detail. The training program utilized a case study approach that gave the attendees an opportunity to answer challenging questions based on the information provided. The feedback from attendees was very positive and many commented on how the training program provided a greater understanding of the challenges facing the Claims department, especially in light of the storm situation.

Shelter Insurance® will continue analyzing detailed data reports about claims from storms. Recent satisfaction surveys conducted after the customer's involvement in a claim indicate that policyholders continue to believe that Shelter delivers on the promise sold with each policy. Those surveys also indicate that the customers would recommend Shelter to a friend. Additionally the Claims Department instigated a process to survey affected agents after a storm to seek other thoughts and ideas on how to continually improve their processes. Combining a high level of customer satisfaction



## Top 10 Shelter catastrophes ranked by severity

Rank	Date	Cat. No.	Event	Net paid
1	March 11-13 / 2006	73	Wind, Hail & Related Perils	101,243,637.81 USD
2	August 28 / 2005	65	Hurricane Katrina	86,883,170.30 USD
3	September 23 / 2005	66	Hurricane Rita	73,455,869.40 USD
4	May 4-7 / 2003	43	Multi-State Tornado,Wind, and Hail	68,037,126.79 USD
5	April 9-11 / 2008	88	Wind, Hail & Related Perils	56,026,423.06 USD
6	April 9-12 / 2001	21	I-70 Hail & Wind	55,914,092.18 USD
7	October 3-5 / 2002	37	Hurricane Lili	36,106,672.96 USD
8	April 1-3 / 2006	74	Wind, Hail & Related Perils	33,363,806.39 USD
9	May 7-9 / 2009	96	Tornado, Straightline Winds, Hail	29,120,882.87 USD
10	May 3-6 / 1999	74	Oklahoma City Tornado	25,914,210 USD

and a strong financial position, the Shelter Insurance Companies' employees and agents continue to work for a successful future. That future will mean dealing with catastrophic storms, but that is something the Shelter team understands and is ready to handle.

**The Shelter's Group Companies established both an earthquake reserve and a catastrophic weather reserve**

[www.shelterinsurance.com](http://www.shelterinsurance.com)





## interview to **Dr. Luis Izquierdo**

Researcher and doctor specialized in genetics



Luis Izquierdo López was born in Madrid in 1961.

Following the family tradition, he studied medicine at the Complutense University in Madrid, where he took his doctorate. After this, he moved to Glasgow (UK) to take his Masters in medical genetics.

After returning to Spain, he has worked as a researcher at the Clinical Hospital sponsored by the Health Research Fund (FIS). He has been a professor at the European University of Madrid and since 2000, has been working in his laboratory in the Genetic Research Center (C.I.G.). This center was founded by his father, a doctor specializing in gynecology and genetics in the department headed by Professor Botella, who pioneered the development of cariotypes in Spain during the 1960s (cariotypes are a method of mapping the chromosomes of a cell arranged according to its morphology).



# *"We still have to learn about the structure of many genes"*

Genes are the basic units of heredity. They carry the genetic information needed to synthesize proteins - the chemical compounds whose function is to regulate all the processes in the human body. Researchers have been decoding the information contained in genes over recent decades, enabling them to use genetic tests to assess the likelihood that an individual will contract certain diseases during his or her lifetime. Genetic research is enjoying its heyday, despite the ethical problems that it is generating. Thanks to the decoding of the Human Genome in 2003, there is enormous scope for the future of medical genetics as regards research into diseases and prevention based on the application of personalized solutions.

## **How would you define medical genetics?**

It is the area of medicine that focuses on the diagnosis of hereditary diseases. Victor McKusick, the American professor of medicine who is our doyen, said that just as the kidney is the organ of reference for nephrologists and the heart occupies the same position for cardiologists, the field where medical geneticists "operate" is the Human Genome. McKusick and his collaborators laid the foundations for this specialism in the 1940s and 1950s. McKusick died a short time ago, but it was he who brought together the entire extant body of scientific and medical knowledge on this subject at a certain moment in time.

## **Since you completed your doctoral studies in medicine in 1986, what changes have you seen in the field of genetics?**

Every kind of change. In fact, this has been an excellent period to observe the transformations

that have taken place. We have witnessed a total revolution as regards DNA (the English abbreviation for deoxyribonucleic acid, known as ADN in Spanish, which is the primary substance in chromosomes and genes). I was in Barcelona in 1986 when genetic research was already under way into Duchenne (a type of muscular dystrophy). There is also another disease known as fragile X syndrome (FXS), which causes mental retardation. And at the end of the 1980s, in connection with yet another disease -spinal muscular atrophy- I contacted the researcher who had discovered the mutation gene because I had a family to whom I had to give a diagnosis. I have always worked in this ill-defined border area between research and clinical application. Another very interesting event that I experienced was the discovery of the breast cancer gene. There was a geneticist in New York, Marie Claire King, who was studying several families where it was shown that breast cancer was hereditary,



**Spanish women have a lower incidence of breast cancer than women in Anglo-Saxon countries due to the influence of diet and environmental conditions**

but nobody believed her - until a congress in the 1990s when she managed to prove that it was indeed hereditary, and is in fact one of the most frequent of all hereditary diseases.

**In a genetic heredity profile, is the function programmed in a particular gene bound to trigger, or are there external factors that can prevent this from happening?**

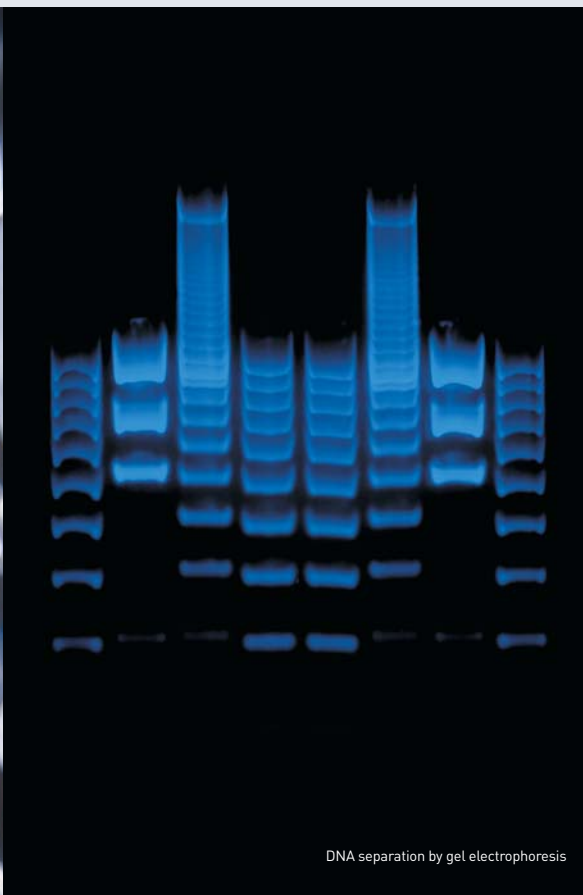
No, it is not bound to trigger. There are many external influencing factors that are still unknown to us. Take breast cancer, for example. What is strange is that women who carry the same anomaly in one of the genes that are known to produce breast cancer are not certain to get the disease. If such women live to the age of 70, 80 per cent of them will contract breast or ovarian cancer. But that figure is for the population in America, where the incidence of breast cancer is higher. When this research was carried out in Spain, which has a lower incidence of breast cancer than the Anglo-Saxon countries (due to the influence of diet and environmental conditions), women carrying this same mutation proved to be less likely to develop the disease. Instead of 80 per cent, the rate of occurrence

drops to 60 or 50 per cent. It's clear that there are other factors which influence the development of the disease.

**In 1969, 300 genetic diseases had been described and 6,000 had been identified by the end of 2000. Is the number continuing to increase at this pace?**

It is continuing to rise, but more slowly. Let's say that development peaked during those years. There are two important factors in the progress of genetics, or in our knowledge of the genes that are responsible for diseases: one is the technology of DNA, which was essentially revolutionized by the polymerase chain reaction or PCR, a fundamental process in molecular biology. This is a method whereby you can obtain hundreds of thousands of copies from one fragment of genetic material. It is like cloning a fragment of DNA. This has been a key element in the search for genes that transmit diseases, making it possible to sequence and complete the Human Genome, which is the combination of genes that characterizes our species. The other factor is the computer. This research would have been impossible without computers or information technology. Over this period, the advance of computer technology and the develop-





The applications for medical genetics are basically, the diagnosis and prevention of hereditary diseases

ment of PCR, which emerged in the mid-1980s, were the factors that made it possible to discover many of the genes that are related to diseases.

**What are the applications for medical genetics?**

Basically, the diagnosis and prevention of hereditary diseases.

**And is it possible to intervene before the symptoms appear?**

No. But in terms of prevention, it is sometimes possible to take action so that the patient does not suffer with the disease. For instance, if you make a diagnosis before the appearance of symptoms of hemochromatosis, which is one of the most frequent hereditary diseases, you can prevent the person from suffering the consequences of the disease by administering a simple treatment throughout their lifetime.

**Who has an interest in knowing an individual's genetic profile?**

First and foremost, other doctors who specialize their own fields. Cardiologists want this information to detect heart rhythm disorders; it helps pediatricians to identify malformation problems;

neurologists can utilize it to confirm neurological diseases that they detect, and it is also helpful to oncologists if they suspect the presence of hereditary cancer. All these groups send us patients according to their specialist areas.

**What interest does the insurance industry have in this field?**

It is a way of diagnosing and preventing diseases. That is the key fact.

**Is there any kind of restriction on the use of genetic data or information by insurers?**

The new (Spanish) Law on Assisted Reproduction passed in 2006 refers to the confidentiality of genetic data. It states that this data regarding clinical history is confidential, and is the property of the patient; so in that respect, it does not differ greatly from other data. This means that patients can forward this data to an insurance company or to anyone else they like.

**Can insurers request a genetic test at a specific time?**

That could happen, but such tests are not carried out at present.



Digital illustration of DNA structure



**Genetics is a very transparent science and there are no problems to obtain data on the incidence of diseases or their prevalence in certain groups among the population**

**Genetic science isn't very popular. It can provide information, but maybe it won't produce a specific cure.**

This is something that happens quite often: people expect genetics to provide more than it can really deliver at present. Of course, there are some diseases that we can cure or prevent: hemochromatosis is one example. But in fact, society expects far more than what can be delivered in reality. There are some things that we can do, such as taking preventive action - but we cannot reverse the action of a gene in an individual. It is impossible to block the expression of a gene that is causing a disease in someone; once we have achieved that, we shall definitely be able to cure cancer.

**The Human Genome -or the total number of chromosomes in the body- was decoded in 2003. What was the significance of that?**

It was a fundamental factor in a very large number of fields relating to the diagnosis of diseases.

**What still remains to be done?**

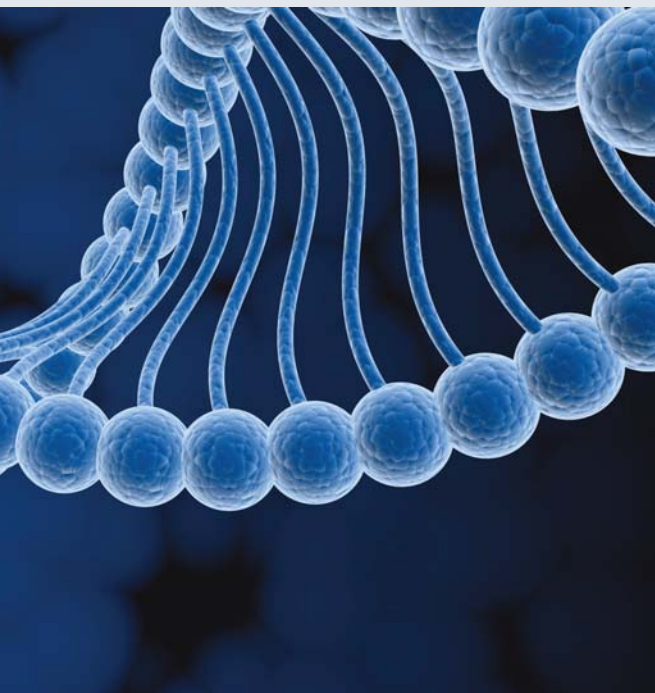
We need to learn about the structure of many genes, how they behave, and so on. Many genes act as regulators of other genes. We still need to discover how they are interrelated, and to identify the functions of certain fragments that have already been sequenced. But this work has had some important implications. In the field of pharmacogenetics, for instance, it is known that

everyone has their own individual susceptibility to the action of a particular drug, and this will lead to individualized medicine in the near future. There is no reason for one psychiatric patient who is taking an anti-depressive treatment to receive the same dose as another patient with a different genetic profile.

**What is the international scope of genetic research as it applies to the insurance sector, given that insurers need information which they can theoretically use to select their clients?**

The recent development of medical genetics as a whole, and of the entire body of knowledge regarding genetics, has taken place in the middle of the Internet era. This has made it one of the most transparent branches of science and one whose consequences for the general public are easier to identify. Work on hereditary diseases or genetic features is being published everywhere. For example, there is a venture called "The Code Genetics" which set out to log the genetic variants for the entire population of Iceland. This is supplying a great deal of information about genetic variants that may cause a predisposition for this or that disease. All of this material has been published. I repeat: genetics is a very transparent science in this regard, and there are no problems when it comes to obtaining data on the incidence of diseases or their prevalence in certain groups among the population.





### **How are these activities regulated in Spain?**

There is no specialist field of medical genetics.

### **Is there a professional association?**

Yes, there are various associations, and many people devote their efforts to this aspect, but the problem is that there is no training program. There are various societies such as the Spanish Association of Human Genetics (AEGH), and (within it) the Association of Medical Genetics (AGM). Then there are two associations within the Spanish Pediatric Society (SEP), which also has a medical genetics section. And there is a prenatal diagnostics section within the Spanish Gynecological and Obstetrics Society (SEGO).

### **Do all the professionals who practice or research here know one another?**

Plenty of them do. But the main problem is that Spain has no officially regulated training in medical genetics, whereas studies in this field are recognized by many countries in the European Union. I think that this is the case in virtually all of them, including Portugal.

### **What advances shall we witness in genetic research over the coming decades?**

Essentially, we shall see the development of drugs that aim to control the expression of genes, or to block genes that are causing a disease.

### **Will it be possible to control the ageing gene? Is it true that we are genetically programmed to live for 120 years?**

Firstly, let's hope that we will be able to control more diseases, including leukemia. There is not one single ageing gene - several different ones are involved. And yes, it is true that life expectancy is continuing to increase. Before antibiotics appeared on the scene, the highest mortality rates were for infectious diseases. After the arrival of antibiotics, mortality due to infectious diseases decreased but there was an increase in mortality caused by other diseases which were unknown until then because people had not experienced them sufficiently. It is possible that we are programmed.

### **Are treatments in connection with medical genetics very expensive? Might they only be available to the elite?**

Yes, they are very expensive. In Spain, they are available to everyone thanks to the public health system, but whether this system can afford the treatments is another question. For example, there are drugs specifically designed for genetic anomalies which could cost as much as EUR 60,000 per week.

### **Is Spain especially prominent in any particular field of genetic research?**

The National Center for Oncological Research (CNIO) is giving an enormous boost to genetic research applied to oncology. There have always been universities focusing on this field, geneticists with sufficient interest in it, and good results. More so in Barcelona than Madrid.

### **Is the USA still the country of reference as regards genetic research?**

Yes. That is basically because it allocates far more money from its budget to research than has been possible elsewhere, and this has enabled the USA to make more progress in diagnostic procedure as well as drugs.

### **Nowadays, with globalization, how long does it take to get a new treatment? A matter of days or hours?**

But it does take time. Being treated by the person who has developed a drug is not the same as treatment by someone who has to learn how to do it. For 99 per cent of diseases or tumors, it is not worth the trouble of going to look for a treatment, but it is still worthwhile in 1 per cent of cases; basically because the USA is a country that invests far more in research than the entire European Union. At the end of the day, the results of this are visible. There is a reason why the best researchers and doctors go there.

**There are drugs specifically designed for genetic anomalies which could cost as much as EUR 60,000 per week**



## interview to **Ghislain Laurent**

General Manager of MAPFRE RE  
in Brussels



Atomium, Brussels

After just a few minutes with Ghislain Laurent, it becomes apparent how much the congenial Belgian loves his job and how he has really enjoyed his career.

“Looking back, the greatest thing is that since I started working in this field in 1974, up until today, I have earned a living without ever feeling like I was working,” he said. “I did not see the years go by.”

That is not to say reinsurance was initially a calling for Mr. Laurent. His main motivation as he finished high school was to move away from the small village where he was born and raised. “I come from the deep countryside, a village of 350 inhabitants in southern Belgium, near the French border,” he said. “When I was six years old, there came about one car a day.”

“In an environment like that,” he continued, “you either have the courage and boldness to get out

of it, or you stay there for the rest of your life, trying to make ends meet.”

While he was eager to move up in the world, Mr. Laurent was also grateful for the self-discipline he developed as a result of his strict rural upbringing. “In the way I was raised, there was a certain strictness and a respect for authority,” he said. “That stays with you for the rest of your life.”

After high-school, he and a friend hitch-hiked to Brussels to carry on with their studies. Initially intent on becoming a civil engineer, Belgium’s classic path to high corporate responsibilities, he gradually found that the high level of mathematics required might be beyond his reach.

Mr. Laurent felt he had more of a gift for learning languages and so joined a translation and interpretation school and graduated with a degree in French, English and Italian.





## *“It never felt like work”*

Ghislain Laurent will retire at the end of June after over 35 years in the reinsurance industry, and 13 years with MAPFRE RE, at the helm of the Brussels office, which he led to spectacular growth in the past decade. We interviewed Mr. Laurent about his long and varied career in the industry and some new aspects of his life were revealed.

After completing his military service, that was compulsory at the time, he applied for various translation positions. The first company to reply to his job applications was Royale Belge, the country’s leading insurer at the time, which has since been absorbed by Axa.

When Mr. Laurent arrived for a meeting with the head of the company’s reinsurance operations, he fully expected to interview for a translator position. But, the recruiter had other plans for him: he was to become a reinsurance professional. At the time, Mr. Laurent had no idea what reinsurance was, and barely knew anything about primary insurance. He was, however, soon to find out in great detail.

Among the insurer’s benefits was a remarkable graduate training programme, which enabled Mr. Laurent to gain a comprehensive grasp of the insurance and reinsurance industry.

“Royale Belge was an exceptional training school,” he said. “I came in with a university degree and underwent five years of paid reinsurance training. Companies do not do that sort of thing anymore.”



Galeries Royales St Hubert, Brussels

Triumphal Arch in the Parc du Cinquantaire, Brussels



**Royale Belge was an exceptional training school**

The first two years were devoted to accounting for cessions and acceptances. This training that Mr. Laurent remains grateful for to this day. “I can take one look at reinsurance accounts and gauge the situation instantly,” he said.

He then spent a year learning the ropes in the underwriting department, another in the foreign relations department, where he was taught how to manage international client relationships, and lastly, a year in the group’s primary insurance business.

“I went through all of the insurance departments, learning about each line of business,” he explained. “To top it all off, I then did three long stays in Italy, followed by two weeks in the London market.”

Mr. Laurent then took on his first proper assignment at Royale Belge, in 1979, as head of rein-

surance underwriting for the Italian market, under the supervision of a seasoned professional. He was gradually put in charge of several other Mediterranean markets including Greece, Turkey, Cyprus and the entire Middle East, and spent almost half the year travelling.

But, despite all the training and international opportunities his stint at Royale Belge had provided, in 1983, Mr. Laurent felt it was time to move on.

“As I matured, I realised I needed more autonomy and more access to final decision making,” he explained. “Royale Belge was heavily centralised and, after a while, I wanted my professional environment to get some fresh air.” Mr. Laurent felt that he was ready for his next adventure so he seized an opportunity to join Groupe Josi, the small reinsurance subsidiary of a family-owned Belgian group that





specialised in motor insurance. The move also brought an increase in remuneration.

Unfortunately, it soon surfaced that, before his arrival, the company had written high-risk business in an effort to make a quick buck in the U.S. This led to the resignation of Josi Re's managing director, whom Mr. Laurent succeeded in 1987.

Josi Re got back on track after some portfolio pruning, but, things started to turn sour again after a string of costly natural disasters: hurricane Hugo in 1989 and four consecutive storms that hit Belgium, Holland and Germany in 1990, and led to a need for fresh capital.

However, Josi Re's parent company was itself cash-strapped, following a sharp rise in motor claims. It decided not to shore up its reinsurance unit, which was put in run-off in 1993.

As a result, Mr. Laurent was put in charge of managing the unit's past, as well as Groupe Josi's own, reinsurance placements.

Cut off from the market and bored with the sessions job, he decided to leave in 1996, and moved to Luxembourg to work for Sogecore, a reinsurance captive management company, as technical director.

After a little over a year, he was approached by the managing director of Brussels-based reinsurance company, CIAR, owned by MAPFRE RE, but also had an offer from a Cologne-based reinsurer. Eager to move back to Belgium and be close to his two children, Mr. Laurent picked CIAR, and joined as technical director in July 1997.

The following year, the group decided to concentrate its capital in Madrid and transfer

**MAPFRE RE has always maintained a policy based on strong capital, extremely rigorous underwriting, with undeniable technical expertise and great customer relations**



CIAR's activities to a newly-created branch of MAPFRE RE in Brussels, with a consolidated team of about 15 employees.

At that time, the branch was managed by the present Managing Director of Mapfre Re, whose duties called him back to Madrid in a relatively short time. Laurent got on very well with him and after one year, in August 1998 was ready to take over.

Alas, shortly after the MAPFRE RE branch was set up, in December 1999, the Brussels team had to face the consequences of winter storms Lothar and Martin, which cost the company a "few dozen million euros". Another challenge followed in 2001, with the terrorist attacks on the World Trade Center and the Pentagon.

**The 1999-2002 period, however, was very motivating and involved more of a physical effort. It was about rolling up your sleeves, restructuring, and returning to growth**

"These were extremely difficult years, and we had to work very hard to get back on track," Mr. Laurent recalled. "Thankfully, MAPFRE RE has always maintained a policy based on strong capital, extremely rigorous underwriting, with undeniable technical expertise and great customer relations." The development of the Branch, namely on the French market, was largely facilitated by the support granted by the Mother company, namely in terms of capacity and new classes of business to be explored.

That period was one of the most challenging times of Mr. Laurent's career, but he said it took less of a personal toll than his last three years at Josi Re.

"These two types of situations have a completely different impact on you," he explained. "The run-off situation is something that affects your morale and can be psychologically destructive. The 1999-2002 period, however, was very motivating and involved more of a physical effort. It was about rolling up your sleeves, restructuring, and returning to growth."

At the time, the branch's portfolio consisted mainly of proportional treaties, with fairly limited margins. Mr Laurent's team then embarked on an effort to refocus on non-proportional underwriting and improve profitability. Non-proportional business now accounts for 95% of the Brussels office's portfolio. The improvement in margins also coincided with spectacular volume growth.

"Back then, we had a turnover of about €10m. Today, we write about €150m, for a much more limited number of countries," Mr. Laurent pointed out.

Indeed, when he joined the group, Brussels was in charge of all European reinsurance business other than Spain and Portugal, with portfolios in Germany, the Netherlands and Switzerland. Responsibility for these markets was gradually transferred to Madrid, or involved the creation of a local office.

Today, the Brussels office remains in charge of France, Belgium, and Scandinavia and retained shared responsibility for Italy, where





Mr. Laurent started his reinsurance career and gained precious market expertise.

“My main satisfaction is to have met my objectives,” he said, “to have managed to profitably develop the Brussels office, while keeping the staff happy, in a serene atmosphere with wonderful colleagues. And it never felt like work!”

Another shared achievement is to have contributed to the international expansion of the MAPFRE brand. “The European reinsurance offices have exported the MAPFRE name beyond Spain,” Mr. Laurent explained. “It is MAPFRE RE that introduced the group in France and Italy.”

During a career that spanned three decades, Mr. Laurent has had the opportunity to witness the many changes that the reinsurance sector underwent over the years.

“When I started out, reinsurance was very much based on gentlemen’s agreements,” he recalled. “You would shake hands, and the deal was sealed. Today, gentlemen or not, things have become extremely formal and heavily regulated, to an extent that was unthinkable 15 years ago.”

“The business has also become extremely technical,” he continued. “When it came to windstorms in the 70s and 80s, there was no

**It is their inventiveness that makes the European markets such as France and Belgium so difficult**



Grand-Place, Brussels



talk of modelling. Today, there is no way you can write a cat portfolio without running model simulations.”

Along with intensifying competition and consolidation of the sector, Mr. Laurent sees the growing strength of reinsurance brokers as another fundamental change.

“In France, which represents a major share of our Belgian branch’s portfolio, there are three main large reinsurance brokers with which you need to be well positioned if you want to have a chance of writing business,” he explained. “It is extremely rare nowadays to be able to work directly with the client in this market.”

He described the French and Belgian markets as both very mature, complex and sophisticated, with several market-specific solutions, such as terrorism or natural catastrophe pools

or specific primary insurance products, such as France’s 10-year construction liability insurance. “It is their very inventiveness that makes them difficult markets,” he said.

When asked what he likes best about the reinsurance field, he said it is the industry’s raw material: risk.

“I am a bit of a gambler,” he said. “Not with cards or at the casino, but, I really enjoy playing the stock market. Stock trading energises me. Sometimes I win, sometimes I lose, but it forces me to stay on top of economic and social trends. It has helped me to understand and perceive a lot of things. I find that same risk/reward aspect in reinsurance, but, I am a lot more careful there, because it’s the company’s money!”

Despite his deep enthusiasm for the job, Mr. Laurent is ready to move on and leave his professional life behind, after over three decades of long workdays and studious weekends. “When I retire, I’m going to stop for good and just enjoy life,” he insisted. “I find it ridiculous to keep working until age 85. There is more to life than work.”

His plans for the coming years will include a lot of travelling beyond Europe, which he had plenty of opportunities to explore throughout his career. Among the new destinations he is most eager to visit are South America, Canada, Australia, China, Japan, and also the United States at large.

“I had the opportunity to go to New York, Boston and Los Angeles countless times between 1985 and 1992 while at Josi Re,” he explained. “I was part of a committee in charge of defending the interests of various Europeans reinsurers against ceding companies involved in fraudulent deals on the US market. I only know those three cities, so I’d like to discover the rest of the country.”

Another major project for Mr. Laurent’s retirement is his upcoming move to the sunny French Riviera. He intends to take a few days off this spring to go house hunting in the Var region, and is looking forward to the change of scenery.

“Belgium has a lot of things going for it,” he joked, “but weather isn’t one of them.”



View of Brussels



# agenda

## COURSES ORGANISED BY MAPFRE RE

Course	Date	Venue
Contingency Plans	18 <sup>th</sup> - 19 <sup>th</sup> October	Caracas, Venezuela
Contingency Plans	21 <sup>st</sup> - 22 <sup>th</sup> October	Bogotá, Colombia
Contingency Plans	27 <sup>th</sup> - 28 <sup>th</sup> October	Mexico, Mexico
Environmental Risks	10 <sup>th</sup> June	Madrid, Spain
Environmental Risks	17 <sup>th</sup> June	Barcelona, Spain
Machinery Breakdown	18 <sup>th</sup> - 19 <sup>th</sup> October	Bahrain
Risks inspection	2 <sup>nd</sup> - 4 <sup>th</sup> November	Czech Republic

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