

# Market Watch



## Nature Travel and Ecotourism: Animal and Human Health Concerns, October 2001

### Summary

Tourism has recently become the world's largest industry, with tourist receipts of \$476 billion, and international tourist arrivals worldwide of 698 million in 2000. The fastest growing segment of the tourism industry is nature travel and ecotourism, with an annual growth rate of 10-30%. Currently one in five tourists is an ecotourist. The United Nations has designated the year 2002 as the International Year of Ecotourism. World Tourism Organization analysts predict that the terrorist events of September 11, 2001 will not have a significant long term effect on tourism growth.

Nature travel and ecotourism are characterized by travel to natural areas, often in developing countries, to enjoy wildlife and outdoor oriented activities. Popular ecotourist destinations include many countries in Asia, Africa, and Central and South America, where livestock diseases of concern are endemic and where new diseases are likely to emerge. Many factors associated with disease emergence are also associated with nature travel and ecotourism, including the movement of people into an undeveloped rural environment, environmental changes, and increased contact of humans with wildlife and arthropod disease vectors. Since travelers have the potential to act as biological or mechanical vectors of certain zoonotic and animal diseases, educating nature travelers and ecotourists concerning biosecurity measures to follow during their journey and upon returning to the US, may help to prevent the transmission of existing or emerging animal and zoonotic diseases.



*“Endangered primate populations are particularly vulnerable .... and are susceptible to so many pathogens carried by humans. Alternatively, many primate diseases can easily be transferred to humans, ... for example, while on safari in eastern Africa, I observed a vervet monkey urinating into the bowl of pineapple on the breakfast buffet, visual proof of the dramatic possibilities for transfer of disease agents through bodily fluids.”*

*Excerpt from “Emerging Diseases of Animals”, edited by Corrie Brown and Carole Bolin, ASM Press, 2000.*

## Introduction

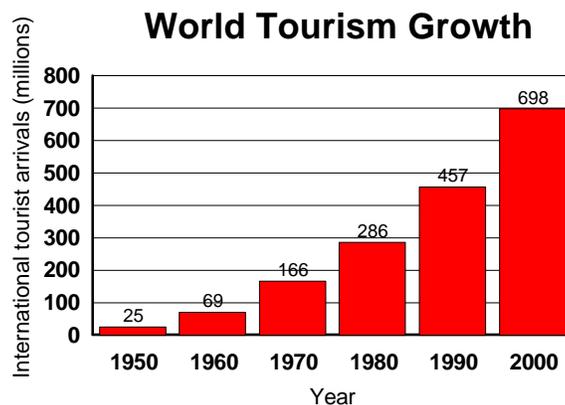
Societal and technological changes over the last century have led to enormous increases in travel and trade. The value of world trade in agricultural products has increased from about \$52 billion in 1970 to about 417 billion in 1999 (FAO). During the past 50 years tourism has grown to become the world's largest industry, with international tourist arrivals increasing from 25 million to 698 million (Travel Industry World 2000 Yearbook, WTO: Millennium Tourism Boom). This increase in travel and trade has increased animal and human disease transmission risk. National governments have sought to mitigate this risk and protect their native animal and human populations through import restrictions on animals and animal products which could transmit disease. International tourism is not regulated in the same way, in part because tourism provides major economic benefits to the host country. Tourist visas are easy to obtain for most countries and there are few other legal impediments to human travel between countries. Therefore, disease incursion risks associated with tourism are more difficult to manage. Education of travelers and inspection of their belongings at ports of entry are the primary means currently employed by governments to mitigate the risk of disease transmission related to travelers.

Travel of people, animals, animal products, and arthropod disease vectors (e.g., mosquitos, ticks) is a major pathway for the spread of infectious human, animal, and zoonotic diseases around the world. Zoonotic diseases are diseases transmissible under natural conditions from vertebrate animals to humans. Infectious diseases can move in both directions, with the traveler becoming infected at the location visited, or the local people, animals or vectors becoming infected from the traveler. History abounds with examples of disease emergence related to human migration and animal trade, such as the global spread of plague, smallpox, and foot-and-mouth disease. Although the specific source is unknown, the movement of either humans, animals, or mosquito vectors is thought to have led to the recent emergence in new geographic areas of two zoonotic diseases, West Nile virus in the United States, and Rift Valley fever virus in Saudi Arabia.

This report explores current trends in the tourism industry, particularly nature travel and ecotourism, and factors associated with disease emergence and spread related to travel. The potential for emerging animal and zoonotic disease transmission risk associated with nature travel and ecotourism is discussed.

## Tourism Trends

Tourism is defined as “the temporary movement of people to destinations outside their normal places of work and residence, the activities undertaken during their stay in those destinations, and the facilities created to cater to their needs” (Cook, Yale, Marqua, 1999). Tourism is the world's largest industry with international tourist receipts in 2000 of \$476 billion, generating



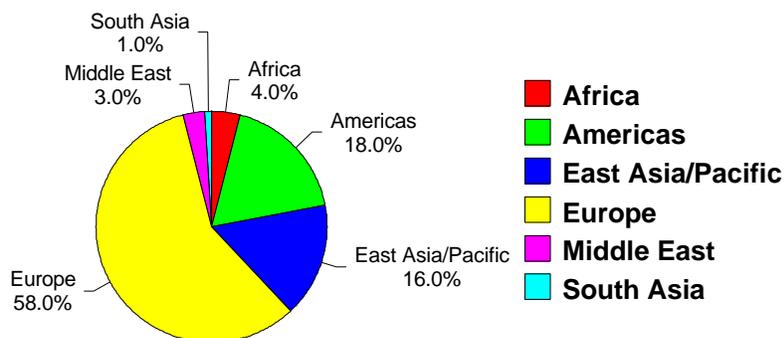
Source: World Tourism Organization

approximately 12% of the world’s economy (Travel Industry 2000 Yearbook). The number of world tourist arrivals grew an estimated 7.4%, to 698.3 million in 2000, the highest annual growth rate in nearly a decade. The World Tourism Organization forecasts that international arrivals will reach over 1.56 billion by the year 2020 (WTO: Long-Term Forecast Tourism 2020 Vision).

According to the World Tourism Organization’s (WTO) analysis, barring new and extraordinary developments, the terrorist attacks in the US which occurred on September 11, 2001, will not have a serious effect on world tourism growth (WTO: The impact of the attacks in the United States on international tourism: An initial analysis). The WTO has reduced its short-term forecast for tourist arrivals in 2001 following the terrorist attacks, from 3.0% growth to 1.5% growth. The Secretary-General of the WTO has stated that “experience has shown that tourism has great resilience and great power to recover from a crisis, if travel is down one year then pent up demand will result in extraordinary growth the next year” (WTO news release: General Assembly unifies global tourism industry in crisis, October 1, 2001).

Not only has the tourism industry grown quickly over the last several decades, but the destinations visited have changed and diversified considerably. In the 1950’s, the top 15 countries visited, all in Western Europe and North America, attracted 97% of total world tourist arrivals. In 1999, the top fifteen countries visited only attracted 62% of total arrivals. In addition, in 1999 the top fifteen destinations included China, ranked at number five in number of tourist arrivals, and several Central and Eastern European countries (WTO: Diversification of Tourism).

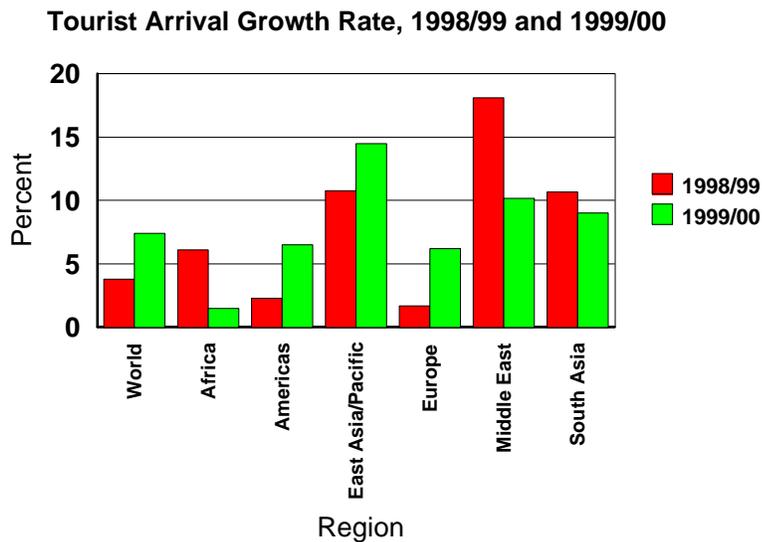
**Tourist Arrivals Market Share, 2000**



Source: World Tourism Organization

Between 1998 and 2000, all world regions experienced an increase in tourist arrivals. The fastest developing tourist region between 1999/2000 was East Asia and the Pacific with a growth rate of 14.5%. Between 1998/1999, the fastest developing tourist region was the Middle East, with a growth rate of 18.1%. The fastest tourism growth in the Americas in 1999/2000 was in Central America, with 8.8% growth, while in North America, tourism grew by 7%. Tourist arrivals in South Asia grew by 10.7% and 9% in 1998/1999 and 1999/2000, respectively (WTO: Millennium Tourism Boom). As a region, Africa enjoyed only modest annual international tourist growth of 6.1% in 1999 and 1.5% in 2000. However, certain countries in Africa saw large increases in arrivals. For example, tourist arrivals in Kenya grew 30% and in Zambia grew 26%, from 1999 to 2000 (WTO: Millennium Tourism Boom).

WTO forecasts the top three receiving regions in 2020 will be Europe (717 million tourists, 45.9% market share), East Asia and the Pacific (397 million, 25.4% market share), and the Americas (282 million, 18.1% market share), followed by Africa, the Middle East and South Asia. Long haul travel is expected to grow faster than intraregional travel, with a ratio of 76:24 between intraregional and long haul travel in 2020.



Source: World Tourism Organization

## Nature Travel and Ecotourism

Tourism and tourists can be segmented by type of destination and by tourist characteristics. For example, the mass tourist prefers to go to areas where there are large numbers of tourists, requiring a large infrastructure (hotels, resorts, etc.) to accommodate them. In contrast, alternative tourism or special interest travel, advocates an approach opposite to mass tourism (Fennel, 1999). Types of special interest travel are nature travel, adventure travel, and ecotourism. Nature tourism is the most general term and is defined as travel for the purpose of enjoying undeveloped natural areas or wildlife. Adventure travel is similar to nature travel, but includes an element of risk for the traveler. In addition to the enjoyment of natural areas, ecotourism by definition specifically incorporates the principles of sustainability, a focus on experiencing and learning about nature, a local orientation with respect to economic benefit and culture, and contributes to the conservation or preservation of the natural area (Fennel, 1999).

### Special Interest Travel

**Nature travel** - outdoor oriented activities in undeveloped natural areas to enjoy wildlife (visits to national parks, hiking, biking, birdwatching, etc.)

**Adventure travel** - outdoor oriented activities in unusual, exotic, remote, wilderness areas that include some element of risk (rock climbing, whitewater kayaking, wilderness survival, wild game hunting, etc.) (ATS)

**Ecotourism** - responsible travel to natural areas that conserves the environment and sustains the well-being of local people (TIES)

Ecotourism is the fastest growing segment of the tourism industry, with an annual growth rate between 10% and 30%. Ecotourism currently comprises about 20% of the world travel market (TIES: Ecotourism Statistical Fact Sheet). Travelers in ecotourism markets seek a wide range of activities, both land and water based. Hiking/treking, wildlife viewing, and visiting parks and protected areas are the most popular activities (TIES: North American Ecotourism Markets: Motivation, Preferences, and Destinations). A market demand assessment survey of North



American tourists commissioned by the Canadian government in 1994 indicates that experienced ecotourists are usually between 35 - 54 years of age, are equally male and female, are more educated, spend more, have a higher-than-average income, and are more frequent travelers, than general tourists (TIES: North American Ecotourists: Market Profile and Trip Characteristics).

Ecotourism usually involves tourists from developed countries (eg. North America, Europe, Australia) visiting ecotourist destinations in developing countries, although developed countries also have natural areas which draw ecotourists. Well established ecotourism destinations include Central and South America, Africa, Asia and the Pacific. Costa Rica was one of the top ecotourism destinations in the world during the 1990's. Nepal has experienced an explosion of ecotourism, with the number of trekkers increasing 255% from 1980 to 1991 (TIES: Ecotourism Statistical Fact Sheet).

Ecotourism is intended to support the protection of natural areas by generating economic benefits through employment and income opportunities for the local community and local organizations which manage the natural areas. Although the principles of ecotourism are intended to be environmentally friendly, ecotourism development in natural areas will inevitably lead to increased numbers of tourists and infrastructure building (e.g., ecolodges, roads), which will change the natural environment to some degree.

The global importance and potential impact of ecotourism has been recognized by the United Nations, which has designated the year 2002 as the International Year of Ecotourism. The International Year of Ecotourism is intended to encourage the cooperative efforts of governments, international and regional organizations, and non-governmental organizations to promote development and protection of the environment, particularly in developing countries, through ecotourism. To this end, many regional conferences and seminars on specific aspects of ecotourism will take place during 2001 and 2002 worldwide, culminating in the World Ecotourism Summit to be held in Quebec, Canada in May 2002.

### **Nature Travel, Ecotourism and Factors Associated with Disease Emergence**

Nature travel and ecotourism involves the travel of people into generally undeveloped natural areas with an abundance of wildlife. Travelers have the potential to become infected with a transmissible disease and act as biological vectors, or become contaminated with the disease causing microbe or arthropod vector (eg. tick) on their person, clothing, or possessions, and act as mechanical vectors of disease. Movement of people or animals into an undeveloped rural environment poses particular disease risks due to contact with pathogens in the soil and water, and pathogens carried by animals or arthropods (Wilson, 1995). Visitors to a new region are at increased risk for

#### **Factors Associated with Disease Emergence and Nature Travel/Ecotourism**

- 1) Movement of people into an undeveloped rural environment
- 2) Environmental changes (eg. deforestation, road/infrastructure building)
- 3) Increased contact of humans with wildlife
- 4) Increased contact of humans with arthropod disease vectors (eg. mosquitos, ticks)
- 5) Increased risk of infection with local diseases for people visiting a new area



*“Nearby, a pet keel-billed toucan hops about, the Fruit Loops bird come to life... Inside an open community hut, logs are being pushed into a fire that will cook my chicken-stew dinner--as soon as the free-ranging main ingredient is captured and plucked.”*

*Excerpt from “Panama goes for the green: ecotourism takes root in the rain forest”, by Bill Belleville, Chicago Tribune, June 10, 2001.*

infection with local diseases for several reasons: 1) lack of immunologic experience with the pathogens present in the new location, 2) increased susceptibility due to genetic differences compared to the local population, and 3) lack of knowledge about the disease risks leading to risky behaviors compared to the local population (Wilson, 1995).

Environmental changes brought about by the encroachment of people into undeveloped rural areas, which may occur during development of tourist areas, can alter the local ecology and impact local disease occurrence. Land clearing, new farming methods, and the building of dams and roads, are examples of human activities which have been associated with changes in local disease occurrence. Deforestation has been linked to the emergence of several new zoonotic viral pathogens, including Hendra virus, Menangle virus, and a bat lyssavirus in Australia, and Nipah virus in Malaysia (Brown and Bolin, 2000). Tropical areas, which are popular destinations for nature travel and ecotourists, are particularly likely places for the emergence of new animal and zoonotic diseases because of the increased biological diversity in tropical regions relative to temperate regions.

Travel of humans into natural areas usually involves increased contact with wildlife. Wildlife reservoirs associated with zoonotic pathogens are numerous and some examples are wild birds and *Salmonella*, possums and *Mycobacterium bovis*, and rodents and *Leptospira*. In 2000, an outbreak of leptospirosis occurred among international participants in an eco-challenge event (adventure travel) in Malaysia. A Centers for Disease Control and Prevention (CDC) investigation revealed that 44% of the 158 participants in the eco-challenge event contacted met the case definition for leptospirosis. Swimming in a specific Malaysian river during the event was significantly associated with contracting leptospirosis (CDC, MMWR, 2001).

Travel of humans into natural areas often involves increased contact with a great variety of disease vectors including mosquitoes and ticks. Many vector borne zoonotic diseases have a wildlife or livestock reservoir. For example, Venezuelan equine encephalomyelitis virus, West Nile virus and Japanese encephalitis virus are mosquito born viruses maintained in rodent, bird, and swine reservoirs, respectively. Crimean-Congo hemorrhagic fever virus is a tick born virus maintained in wild hare and bird reservoirs (Benenson, 1990).

Natural and rural areas are often in close proximity to livestock agriculture. Travelers into these regions may come into contact with the local food animals and may consume meat and dairy products which may not be sufficiently cooked or pasteurized. Several travel related livestock



*“In March, I enjoyed a bucolic trip in the Mexican forests of Calakmul with Leticia Valenzuela, a local woman of Mayan descent. The wildlife is extensive.... on the 30 mile forested road into Calakmul, Leticia has seen jaguar 17 times. Driving into the reserve I saw an ocelot... spider and howler monkeys are not at all difficult to observe... On a small side trail in Calakmul, Leticia and I tracked puerco de monte, a small pig known as a collared peccary.”*

*Excerpt from “Healing the Scarred Mayan Forests, Report#2, In Search of True Ecotourism, by Megan Epler Wood*

food borne zoonotic infectious diseases of concern include salmonellosis, brucellosis, yersiniosis and toxoplasmosis. For example, frequent intake of raw meat and frequent traveling abroad is reported to be associated with toxoplasma infection in Norway (Stray-Pedersen and Lorentzen-Styr, 1980). Brucellosis is a major livestock disease in the Mediterranean region, western Asia, and parts of Africa and Latin America (Corbel, 1997). Several reports of human brucellosis cases associated with foreign travel are found in the scientific literature (Revak et al., 1989, Arnow et al., 1984).

In addition to travelers acting as biological vectors of zoonotic diseases, travelers may act as mechanical vectors of several livestock diseases of concern which are endemic in many developing countries. Mechanical transmission occurs when the traveler or their clothing becomes contaminated with a disease causing microbe which can survive outside a host for a sufficient amount of time for subsequent contact with a susceptible animal to occur. An assessment of the risk for international travelers to mechanically transmit animal diseases of concern not currently found in the U.S. concluded that there is a high risk for a contaminated person to transmit Newcastle disease of poultry and swine vesicular disease. A moderate risk of mechanical transmission was found for avian influenza, foot-and-mouth disease, and African swine fever (USDA:APHIS:VS).

## Conclusion

Nature travel and ecotourism are growing segments of the expanding international tourism industry which involves travel to natural areas primarily in developing countries. Popular ecotourist destinations include many countries in Asia, Africa and South America, where livestock diseases of concern are endemic. Many factors associated with new disease emergence are relevant to ecotourism, such as contact with wildlife, the popularity of tropical areas, and disruption of the local ecology due to development and human impact. Tourists can be involved in biological and mechanical transmission of certain animal and zoonotic diseases. Education of US policymakers, the travel industry, and the public, about global animal infectious disease issues is an important step in the prevention of animal disease incursions into the US.



*“...we had reached an ecological wonderland where rare and endangered species are on your doorstep - literally. ....the experience of living deep in the rain forest, looking down on the Ithaca river as it snaked through the trees and breakfasting on our verandah with scarlet and green parrots ..... and possum scamper onto the deck in the hope of being invited to supper.”*

*Excerpt from “For a real kangaroo hop off to the forest”, by Bill Hagerty, London Daily Mail, June 9, 2001.*

*If you seek more information or wish to comment on this Market Watch report, please contact Judy Akkina at (970) 490-7852 or [judy.e.akkina@usda.gov](mailto:judy.e.akkina@usda.gov).*

## References

- Adventure Travel Society (ATS), [www.adventuretravel.com](http://www.adventuretravel.com).
- Arnou PM Smaron M, Ormiste V. Brucellosis in a group of travelers to Spain. *JAMA* 1984;251:505-7.
- Benenson AS. *Control of Communicable Diseases in Man*. American Public Health Association, Washington, DC. 1990.
- Brown C, Bolin C. *Emerging Diseases of Animals*. ASM Press, Washington, DC. 2000.
- Centers for Disease Control and Prevention (CDC). Update: Outbreak of Acute Febrile Illness Among Athletes Participating in Eco-Challenge-Sabah 2000 --- Borneo, Malaysia, 2000. *MMWR Weekly*, January 19, 2001;50(02):21-24.
- Cook RA, Yale LJ, Marqua JJ. *Tourism - The Business of Travel*. Printice-Hall, Inc. Upper Saddle River, NJ. 1999.
- Corbel MJ. Brucellosis: an Overview. *Emerging Infectious Diseases* 1997;3:213-21.
- Fennel DA. *Ecotourism: An Introduction*. Routledge; NY, NY, 1999.
- Food and Agriculture Organization of the United Nations (FAO), FAOSTAT agriculture database, [www.fao.org](http://www.fao.org).
- Revak DM, Swain RA, Guthrie RM, Lubbers JR. Brucellosis contracted during foreign travel. *Postgrad Med* 1989;85:101-2, 104.
- Stray-Pedersen B, Lorentzen-Styr AM. Epidemiological aspects of Toxoplasma infections among women in Norway. *Acta Obstet Gynecol Scand* 1980;59:323-6.
- The International Ecotourism Society (TIES), *Ecotourism Statistical Fact Sheet*, [www.ecotourism.org](http://www.ecotourism.org).
- The International Ecotourism Society (TIES), *North American Ecotourism Markets: Motivation, Preferences, and Destinations*, [www.ecotourism.org](http://www.ecotourism.org).
- The International Ecotourism Society (TIES), *North American Ecotourists: Market Profile and Trip Characteristics*, [www.ecotourism.org](http://www.ecotourism.org).
- The Travel Industry World 2000 Yearbook - The Big Picture. Travel Industry Publishing Company, Spencertown, NY, 2001.
- USDA:APHIS:VS: Centers for Epidemiology and Animal Health. *The Potential for International Travelers to Transmit Foreign Animal Diseases to US Livestock or Poultry*, 1998.
- Wilson ME. Travel and the Emergence of Infectious Diseases. *Emerging Infectious Diseases* 1995; 1:39-46.
- World Tourism Organization (WTO), *Millennium Tourism Boom in 2000* , [www.world-tourism.org](http://www.world-tourism.org).
- World Tourism Organization (WTO), *Long-Term Forecast Tourism 2020 Vision*, [www.world-tourism.org](http://www.world-tourism.org).
- World Tourism Organization (WTO), *Diversification of Tourism*, [www.world-tourism.org](http://www.world-tourism.org).

World Tourism Organization (WTO), The impact of the attacks in the United States on international tourism: An initial analysis. September 18, 2001. [www.world-tourism.org](http://www.world-tourism.org)

World Tourism Organization (WTO), News Release. General Assembly unifies global tourism industry in crisis, October 1, 2001. [www.world-tourism.org](http://www.world-tourism.org)