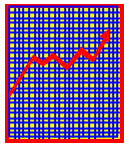


INET'99  
Dimensions of Internet Diffusion  
San Jose, California  
June 23 1999



# Measuring the diffusion of the Internet

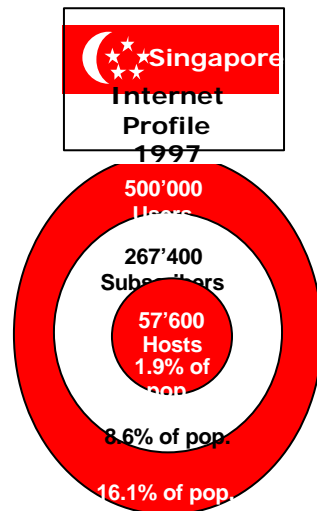


**Michael Minges, [minges@itu.int](mailto:minges@itu.int)**  
**Telecommunication Development Bureau (BDT)**  
**International Telecommunication Union (ITU)**



## Internet diffusion indicators

- Host computers
- Subscribers
- Users
- Overall access, institutional connectivity and "limitation" indicators

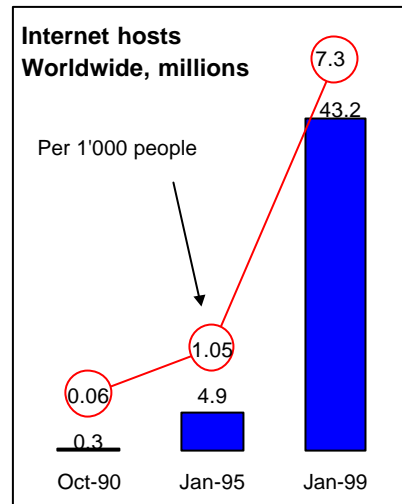


Source: Nielsen, TAS, Network Wizards.



## Internet hosts

- Most widely “misused” indicator of Internet access
- “Tight” definition
- “Scientific” method
- Regular surveys
- Marks minimum size of Internet

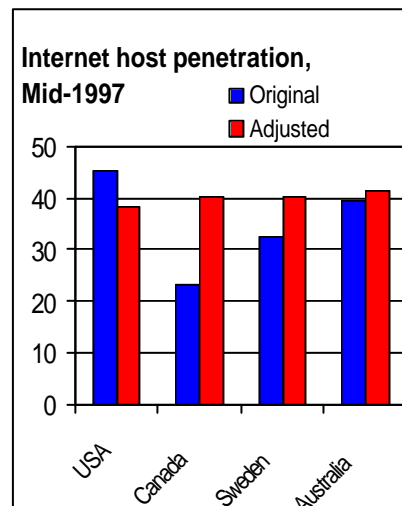


Source: ITU adapted from Network Wizards.



## Host limitations

- Methodology changes
- Differences between Network Wizards, RIPE and national data
- Does not accurately reflect geographical location
- Does not really measure accessibility

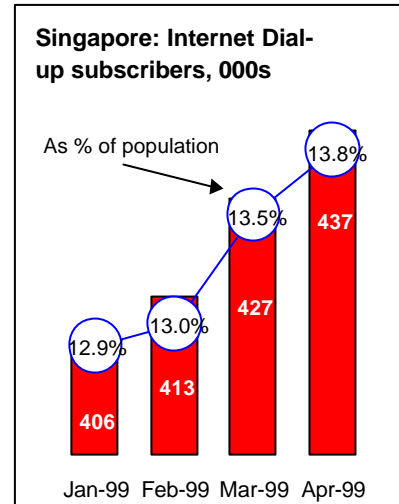


Note: Original as reported by Network Wizards.  
Adjusted according to location. Source: OECD.



## Internet subscribers

- Well-defined
- Increasingly available
- Marks minimum boundary of users

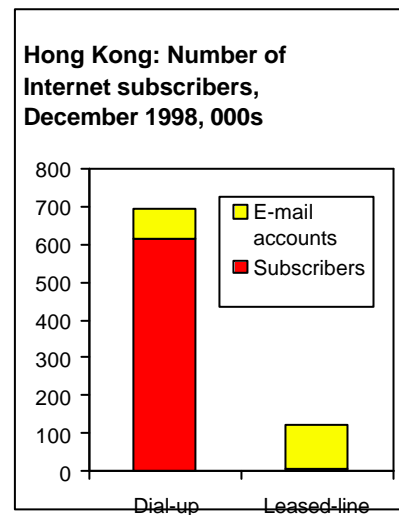


Source: Telecommunications Authority of Singapore  
<http://www.tas.gov.sg>



## Subscriber limitations

- Can be many users utilising one account
- Statistic not universally available
- Does not measure overall access

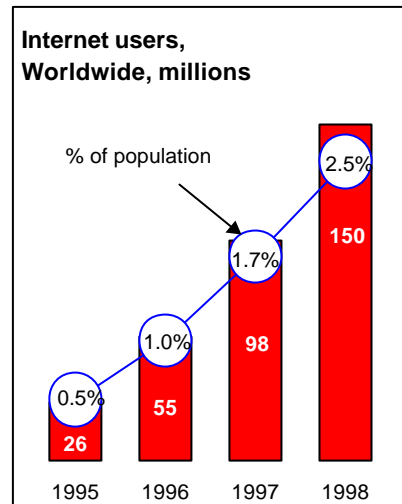


Source: Office of Telecommunication Authority.  
[http://www.ofta.gov.hk/index\\_eng1.html](http://www.ofta.gov.hk/index_eng1.html)



## Internet users

- Better indicator of diffusion than hosts
- Previously multipliers, now surveys
- Data improving as market researchers, statistical agencies and others compile user statistics



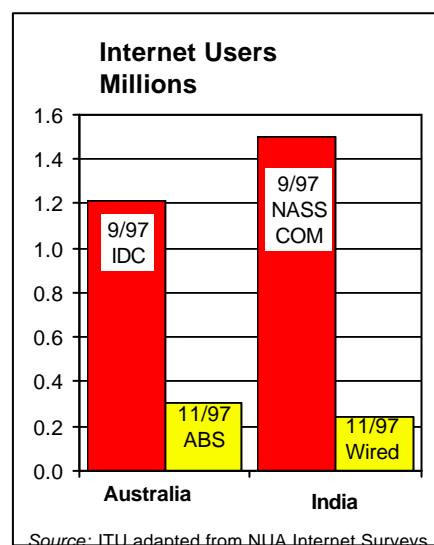
Source: NUA (<http://www.nua.ie>)



## User limitations

- Loose definitions makes comparing users problematic
- Wide variation in estimates
- Usage may not be as important as accessibility

*"There is no way to determine how many users are on the net, besides making guesses and estimates."  
—Network Wizards*

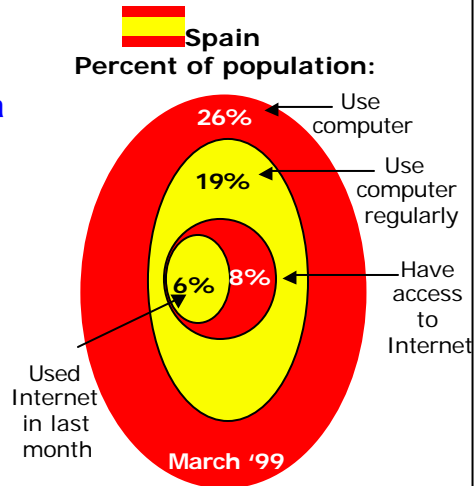


Source: ITU adapted from NUA Internet Surveys



## Accessibility

- Percentage of population with access to Internet is a key indicator
- The location from where users access the Internet (e.g., home, work, school) is also meaningful
- The percent of schools and businesses connected to the Internet are other useful indicators



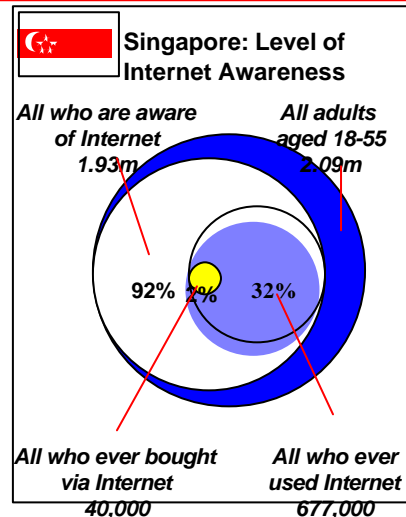
Note: Percentages refer to share of Spanish population 14 years and older.

Source: <http://www.aui.es/>



## Awareness

- Singapore is typical of developed countries where there is a high level of awareness of the Internet
- In developing countries, which tend to have lower levels of literacy and media exposure, many citizens are unaware of the Internet and its benefits

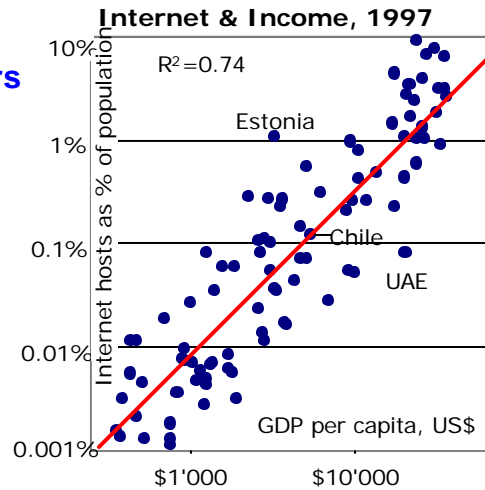


Source: National Computer Board.  
<http://www.ec.gov.sg/ECsurvey.html>



## Don't forget

- ☎ Telephone lines
- 💻 Personal computers
- 💰 Income
- 🎓 Education



Note: Based on 100 countries. Logarithmic scale.  
Source: ITU adapted from Network Wizards and UN data.



## Conclusions

### BEFORE

- “It is not possible to determine the exact size of the Internet, where hosts are located, or how many users there are.”  
—Network Wizards

### NOW

- An increase in organisations compiling Internet statistics is leading to improvements in data quality and availability

### FUTURE

- Data on geographical location of hosts
- Consistent definition of user
- Improved coverage of developing countries

*From a policymaking perspective, percentage of population with access to the Internet is the most meaningful indicator.*