1. ARMENIA
In Facts, Figures and Pictures

2. Telemedicine & e-Health
in Armenia:
History, Current State,
Perspectives for Development

Dr. Georgi Chaltikyan (Yerevan, Armenia)
Armenian Association of Telemedicine (AATM)
ARMENIA

„One Nation, One Culture“

General Information

- Location – South Caucasus
- Area – ca 30 000 sq km
- Population – ca 3 mln (2009 est.)
- Ethnic/Language – Armenian >95%
- Worldwide – ca 9 mln Armenians
- Capital – Yerevan (ca 1 mln)
- Religion – Christianity
- Government – Unitary republic

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History: Origin

- Populated since prehistorical era
- Mt Ararat Biblical site of Noah’s Arc
- First civilizations – 6000 -1000 BC
- Emergence of Armenian ethnicity and linguistics – 10\textsuperscript{th} – 7\textsuperscript{th} BC
- Foundation of Yerevan – 782 BC
- Great Armenia – Tigran II, 95-66 BC
- Official adoption of Christianity – 301 AD (36 years before Rome!)

History: Foreign Rule

- Armenia’s strategic location has made it subject to invasion and conquer by various nations and empires throughout its history: Assyrians (6th BC), Greeks (4th-2nd BC), Romans (2nd BC – 2nd AD), Persians (5th-7th), Arabs (7th-11th), Byzantines (11th), Mongols (13th-16th), Turks (16th-20th) and Russians (19-20th)

- Religion (Armenian Apostolic Church) and Language (alphabet created AD 400-404 by Mesrob Mashtots) allowed to preserve the culture, arts and tradition

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History: Modern

- Armenian Genocide – 1915 during World War I mass deportations and massacres of the Armenians (est 650,000 – 1.5 mln)
- First independent republic – 1918-1920
- Devastating earthquake N-W Armenia – Dec 7, 1988 (est. 50,000 victims)
- Free market economy, stabilization, economic growth – 1995 - present

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Geography

- N-E of the Armenian Highland, between Black and Caspian Seas
- Borders – Georgia (N), Iran (S), Turkey (W), Azerbaijan (E)
- Landlocked and mountainous
- Highest point – Mt. Aragats 4090 m
- Lowest point – Rvr Araks 400 m
- Climate – highland continental, hot summers, cold winters
- Lake Sevan – largest in height range

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Economy

- **Resources** – copper, zinc, Alum.
- **GDP** – industry 40%, service 40%, agriculture 20% (2008)
- **GDP growth rate** – ca 10%
- **Sectors** – chemicals, diamonds, machinery, IT, food, tourism
- **Agriculture** – fruits (esp. apricot, grapes), vegetables, livestock
- **Import** – gas, oil, foodstuff
- **Export** – metals, brandy, jewelry
- **Unemployment** – ca 8% (2008)

World-famous armenian brandy (‘Cognac’)

‘Prunus armeniaca’ = Apricot in Latin

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Culture & Tradition

Seascapes painter
Ivan Aivazovski

Composer Aram
Khachaturian

Writer William Saroyan

Culture & Tradition

‘Matenadaran’ – treasury of ancient manuscripts

Khachkars (‘cross-stones’) – unique stone carvings

Armenian carpets & rugs

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Culture & Tradition

National dance ensemble

Ethnic music band

Culture & Tradition

Renowned hospitality
Distinctive cuisine

Religious rituals (wedding, baptism) & holidays (Xmas, Easter)

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Views: Yerevan

http://www.picturesofplaces.com/, http://www.nationsillustrated.com/, et al
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Views: Lake Sevan

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Views: Lake Sevan

http://www.pbase.com/
# Health Statistics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Armenia</th>
<th>Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP per capita (PPP)</td>
<td>$ 6 600 (2008)</td>
<td>$ 28 335</td>
</tr>
<tr>
<td>Population below poverty line (&lt;$1/day)</td>
<td>12.8%</td>
<td>---</td>
</tr>
<tr>
<td>Population in urban area</td>
<td>64%</td>
<td>93%</td>
</tr>
<tr>
<td>Population in rural area</td>
<td>36%</td>
<td>7%</td>
</tr>
<tr>
<td>Life expectancy at birth</td>
<td>73 years (2009)</td>
<td>81 year</td>
</tr>
<tr>
<td>Total expenditure on health (% of GDP)</td>
<td>5.8%</td>
<td>9.5%</td>
</tr>
<tr>
<td>Government expenditure on health (% of total government expenditure)</td>
<td>6%</td>
<td>17%</td>
</tr>
<tr>
<td>Number of health workers (per 10 000)</td>
<td>80</td>
<td>116</td>
</tr>
</tbody>
</table>

WHO World e-Health Report, 2005; CIA World Fact Book, 2009; MoE/MoH Stats
## Armenian Association of Telemedicine (AATM)

**Equity, Quality, Accessibility, Affordability**

### ICT Statistics

<table>
<thead>
<tr>
<th>Parameter</th>
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<th>Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main telephone lines (per 100 inhabitants)</td>
<td>19.3</td>
<td>55.5</td>
</tr>
<tr>
<td>Mobile phone subscribers (per 100 inhab.)</td>
<td>39.5</td>
<td>65</td>
</tr>
<tr>
<td>Cost of a 3-min fixed line call (US $)</td>
<td>0.02</td>
<td>0.12</td>
</tr>
<tr>
<td>Cost of a 3-min mobile phone call (US $)</td>
<td>0.5</td>
<td>1.6</td>
</tr>
<tr>
<td>Personal computers (per 1000 inhabitants)</td>
<td>89</td>
<td>592</td>
</tr>
<tr>
<td>Internet users (per 1000 inhabitants)</td>
<td>68</td>
<td>523</td>
</tr>
<tr>
<td>Internet hosts (per 100 000 inhabitants)</td>
<td>95</td>
<td>13 157</td>
</tr>
<tr>
<td>ICT expenditure (% GDP)</td>
<td>6%</td>
<td>17%</td>
</tr>
<tr>
<td>ICT generated % GDP</td>
<td>1.2%</td>
<td>1.1%</td>
</tr>
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</table>

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Communications

Fiber-optic – Trans-Asia-Europe; Moscow intrn switch; Mobile operators – 2 (+1)
Telemedicine in Armenia


- 1993-present – Several isolated projects at local medical institutions (Diagnostica Medical Center, Emergency Medical Center, YSMU Center of Clinical Pathology); mostly “store-and-forward” techniques over low-band-width connections (teleradiology, telepathology).

- 2002-present – Several distance learning and Internet-based CME activities by collaborative efforts of Yerevan State Medical University (YSMU), Arabkir Medical Center, together with Fund for Armenian Relief (FAR), American Austrian Foundation (AAF), and some other local and international funds and organizations.

ICT sector production US$111 million (US$38 million in 2003) – around 1.2% of GDP (Germany – 1.1%).

Majority of secondary care institutions and almost all primary care facilities lack sustainable access to high-speed Internet, as well as other modern telecommunication routes.

Major multi-disciplinary tertiary care institutions in Yerevan lack necessary IT equipment and communications.

Electronic Health Records, Hospital Information Systems, PACS, Intra-/inter-institutional data transfer almost non-existing

Shortage of specialist doctors in community health care facilities

Insufficient exposure of rural health specialists to CME sources

Source: EIF, 2008; UITE, 2008; USAID, 2008; Ministry of Health of Armenia, 2008
Armenian Association of Telemedicine (AATM) is a non-governmental, non-profit organization founded in December 2008 by a group of physicians in Yerevan, Armenia, interested in exploring and developing the field of Telemedicine and e-Health in Armenia as well as worldwide.

The mission of AATM is to bring the Telemedicine and e-Health field in Armenia to existing international standards, while at the same time participating in further progress in the field worldwide.

The major goal of AATM is to assist in increasing equity, quality, accessibility and affordability of health care, medical education and medical sciences in Armenia via exploration and deployment of various Telemedicine and e-Health applications and services.

http://www.armtelemed.org
AATM in Brief

Main Directions of AATM Activities:
- Centralized coordination and support for Telemedicine and e-Health activities in Armenia;
- Cooperation between various institutions and Telemedicine services providers locally;
- Cooperation with major international associations, agencies and industry groups in the field;
- Development of educational activities and assisting in staff management;
- Cooperation with central and local governmental structures; working in legislature area;
- Expansion and further development of the Association.

http://www.armtelemed.org
Armenian Association of Telemedicine (AATM)  
Equity, Quality, Accessibility, Affordability

Proposed Strategic Development of TM & eH in Armenia

- In-depth investigation of the field and market of TM and eH and disclosure of the major medical, social and economical benefits of TM and eH for Armenia.
- Support for and boosting of investments in Telemedicine and e-Health.
- Participation in the international telemedicine network, including cooperation with national and international institutions and health care facilities delivering telemedicine services.
- Establishment and development of a National Telemedicine Network; establishment of RESO institution – Remote Expert Second Opinion; creation of MTMU – special Mobile Telemedicine Unit.

Index project (May 2009): “Internet-Based Telemedicine System for Community Health Centers” to establish and operate a TM connection between an office in Yerevan and community health care facilities in remote areas, providing teleconsulting services by specialists in Yerevan to remote site’s patients / GPs.

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Proposed Strategic Development of TM & eH in Armenia

- Establishment and development of Hospital Information Systems, Intra- and Inter-Institutional Data Transfer Systems.

- Creation, expansion and maintenance of Electronic Health Records (e-records), and electronic management of patient-related information (e-prescription, e-referral).

- Deployment of a National Public Health portal providing dedicated information to citizens for health education, safety at work and disease prevention.

- Creation, expansion and maintenance of home telecare facilities and network.

- Organization of educational and training courses on TM and eH for the medical community, GPs / family doctors, and other interested parties.

http://www.armtelemmed.org
Proposed Strategic Development of TM & eH in Armenia

- Developments in the field of **e-learning and CME**: establishing of a national distant medical education network.

- Creation of **telesurgery unit(s)**, providing opportunity for bidirectional telesurgical services, such as performing distant surgical procedures by international experts on local patients, and by metropolitan surgeons on remote patients in community sites.

- Development of **roadmaps, recommendations and guidelines** for wide implementation of TM and eH systems and services (including reimbursement and liability issues); Introduction of legal, ethical and regulatory measures for TM and eH services.

- Dissemination of best practice by international collaborations.

[http://www.armtelemmed.org](http://www.armtelemmed.org)
Cooperation and Partnership

Several major local and international organizations and companies (including those working in ICT sector) have expressed their interest in proposed activities, and their intention to contribute by providing technical and human resources:

- Union of Information Technology Enterprises of Armenia (UITE);
- Sourcio CJSC (Armenia);
- Microsoft RA (Armenia);
- Alfa CJSC, Melinet CJSC etc;
- International Society for Telemedicine and e-Health (ISfTeH);
- American Telemedicine Association (ATA).

AATM looks forward to actively collaborating with any local or international state, non-governmental or private organization, as well as all individuals interested in building better, brighter future for health care in Armenia!

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Thank You