Value of Rapid DNA for Human Trafficking, Border Security, Counterterrorism, and Human Rights

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Human Trafficking
Investigative Assistance
Major Objectives for use of Rapid DNA in TIP Cases

• Improve investigative outcomes and increase successful prosecution
• Reduce secondary victimization and unnecessary victim trauma
• Introduce new forensic science applications and advances at the local level, building local capacity
• Secure input and explore collaboration
In 2016, we estimate that 45.8 million people are in some form of modern slavery in 167 countries.

This estimate draws on data from random sample, nationally representative surveys conducted by Gallup.
The profits made from Human Trafficking

- Sexual Exploitation: 66% | $99 Billion
- Domestic Servitude: 5.3% | $8 Billion
- Forced Labour Exploitation: 28.7% | $43.2 Billion

Information from: International Labour Organization © Human Trafficking Center 2015
Critical Barriers to Progress

Innovative Applications of O.R.

Overcoming human trafficking via operations research and analytics: Opportunities for methods, models, and applications

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Targeting & Identifying Perpetrators: DNA As An Investigative Tool
Brothels – Mapping Locations
Sex Tourism

“Everyone is sooo friendly”

Reviewed September 3, 2013
Wow! When I saw the reasonable rate, I asked my friends about the hotel. They tried to dissuade me, telling me to stay at a classier place, but boy were they wrong. The people there really take notice of you. I’ve been trying to exercise lately and have lost a few pounds and boy did the ladies notice. You just... More

I’m not a tourist attraction
Stop child sex tourism.
Sex Tourism
14 years old: $400 per session—“I’m Special
Collection of Known Samples
ANDE Rapid DNA Analysis System

Sample Collection Swab → BioChipSet™ Cassette → Fully Automated Instrument
Swab – Exterior Condom
Swab from Drinking Glass
Rapid DNA Results from Case Study Sites

• Excellent results on known buccal swabs from victims
  – No real difference with victim’s taking their own samples
• Partial and Full (less frequently) results from swabs taken from:
  – Water and soda bottles
  – Shot and wine glasses
  – Straws
  – Cigarette butts
• Ability to obtain profiles from separate swabs taken from inside and outsides of used condoms
Advances with Ande since 2013

• Desiccant swab tubes
• I-Chip
• 27 Flex Plex
• Differential Extraction – Sexual Assault Samples
Border Monitoring for Human Trafficking and Human Rights Victims
(CNN) — The U.N.'s refugee agency reports that the number of displaced people is at its highest ever -- surpassing even post-World War II numbers, when the world was struggling to come to terms with the most devastating event in history.

The total at the end of 2015 reached 65.3 million -- or one out of every 113 people on Earth, according to the United Nations High Commissioner for Refugees (UNHCR). The number represents a 5.8 million increase on the year before.

A little under 1% of the earth's population is either "an asylum-seeker, internally displaced or a refugee" according to the UNHCR report, which was released Monday.
Identification Issues
A biometric identity checking firm has found that most people are unable to spot forged passports in a new study.

Identity confirmation service HooYu cited a new study conducted by Atomik research, in which a sample of 1,013 people were asked to identify if a passport was a real document or a fake. The results showed that 68% of the time people are unable to correctly identify a fake passport.
The report was based on a source of 'moderate confidence', suggesting that ISIS's printing of passports is in no way confirmed.

The false passport in the name of Ahmad al-Mohammed (left) was found at the Stade de France and was registered in the Greek island of Leros. Fellow ISIS suicide bomber Bilal Hadfi (right) is also thought to have illegally returned to Europe to carry out the deadly attacks.
Next Generation Identification (NGI)

Identification and Investigative Services

The NGI system, developed over multiple years, is an incremental replacement of the Integrated Automated Fingerprint Identification System (IAFIS) that provides new functionality and improves existing capabilities.

The FBI's Criminal Justice Information Services (CJIS) Division operated and maintained IAFIS, which became the world's largest person-centric biometric database when it was implemented in July 1999. Since then, advancements in technology and the changing business needs of IAFIS's customers necessitated the next generation of identification services. To further advance biometric identification services, the CJIS Division, with guidance from the user community, established the vision for the Next Generation Identification.

This technological upgrade accommodates increased information processing and sharing demands from local, state, tribal, federal, and international agencies. The NGI system offers state-of-the-art biometric identification services and compiles core capabilities that serve as the platform for multimodal functionality.

Advanced Fingerprint Identification Technology (AFIT)

AFIT, deployed on February 25, 2011, enhances fingerprint and latent processing services, increases the accuracy and daily fingerprint processing capacity, and improves system availability. This deployment implemented a new fingerprint matching algorithm which has improved matching accuracy from approximately 92% to over 99.6%. This improvement resulted in over 900 additional matches during the 5-day parallel operations period immediately after deployment. Additionally, the improved accuracy resulted in a 90% reduction in the number of manual fingerprint reviews required by our service providers.
Case Study II: Nepal
Intelligence-Led Investigations

- Data collection
  - Initiates the process
  - Various sources of data
    - Police Reports
    - Immigration records
    - Victim interviews
    - Suspect interviews
    - Open source records
    - Information from NGOs
    - Tips
    - Self-initiated
Border Monitoring
USING RAPID DNA FOR KINSHIP ANALYSIS

- 27 Flex Plex
- Obtain 99.5% Certainty more often
- Portable
- Diverse Environments
- Rapid Results
Counter Terrorism and Border Security
Kuwait makes DNA tests mandatory after ISIS bombing

Kuwait flags are draped over bodies of victims of the Friday bombing, at Al Jafariya cemetery in Suleibikhat. (Reuters)
Human Rights implications

- Human rights applicable to migrants.
- Right to privacy and data protection.
- Principle of non-discrimination.
- Freedom of movement.
“No one shall be subjected to arbitrary interference with his privacy, family, home or correspondence, nor to attacks upon his honour and reputation. Everyone has the right to the protection of the law against such interference or attacks.” (UDHR, Art. 12)

- **Universal right**: The right to privacy is not restricted to nationals of a country, nor is there a distinction between non-nationals in regular or irregular situation.

- **Data protection**: Everyone has the right to privacy, this includes the right to have personal data protected against potentially intrusive data processing practices and unauthorized disclosure.
In Response to Kuwait
- DNA Database Challenges

• UN Human Rights Committee
  – *Disproportionate and violation of right to privacy*
• Human Rights Watch
• European Society of Human Genetics
• Forensic Genetics Policy Initiative
• Etc.
Afghanistan as a Country of Transit

There are very few instances in which Afghanistan was used as a country of transit. Known instances predominately involve the transportation of people from Iran through Afghanistan and into Pakistan.
Transit Routes
Map 1: The principal migrant routes to Europe⁶

“Migrant, Refugee, Smuggler, Saviour” Tinti and Reitano
“Migrant, Refugee, Smuggler, Saviour” Tinti and Reitano
East Africa – Refugees
Respond Tactically with Booz Allen’s VAMPIRE™ Mobile Tactical Forensic Device

Immediate. Accurate. The VAMPIRE™ Tactical Forensic Device gives frontline law enforcement and military operators the instant answers they need to deliver a tactical forensic edge in the field. The VAMPIRE™ handheld conducts real-time analysis in the field, performing fast, accurate, on-site latent and live fingerprint identification and matching analysis in just seconds.

Performing Onsite, Real-Time Mobile Forensic Collection, Analysis, and Identification
Syrian refugees surpass four million

Turkey: 1,805,255
Lebanon: 1,172,753
Iraq: 249,726
Jordan: 629,128
Egypt: 132,375
North Africa: 24,055

Source: UNHCR, Government of Turkey / 7 July 2015
Syrian refugees at the Za'atari refugee camp near Mafraq, Jordan, in Jan. 2013

Photo credit: Getty Images
Victim Identification and Association to Illegal Activities, Suspects and Locations
Transportation of Victims
Snapshot Prediction Results
Composite Profile
Case #ELLEN-GREYTAK
PNL Reference #14L16AK46DM

Predicted (■) & Excluded (☒) Phenotypes

- **Skin Color**:
  - Very Fair or Fair (97.1% confidence)
  - NOT Lt Olive, Olive, or Dark (97.1% confidence)
  - 6.9%

- **Eye Color**:
  - Green or Blue (79.4% confidence)
  - NOT Brown or Black (99.3% confidence)
  - 7.4%

- **Hair Color**:
  - Blond or Red (98.8% confidence)
  - NOT Brown or Black (98.8% confidence)
  - 15.4%

- **Freckles**:
  - Few or Some (79.2% confidence)
  - No excluded phenotypes
  - 39.2%

**Sex**: Female
**Ancestry**: 100% European (Northwest – British Isles)
A mass grave at a suspected human trafficking camp hidden in a jungle in Thailand’s south along the border with Malaysia. Damir Sagolj/Reuters
Assisting Cases Involving Labor Trafficking

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Isolation and identification of age-related DNA methylation markers for forensic age-prediction
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Thank you and Questions?

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