

**RAPID DNA TECHNOLOGY FORUM**

**AUGUST 14 - AUGUST 17**



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

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Chair Forensic Science

Center for Forensic Investigations of

Trafficking in Persons



**University of New Haven**

***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**

GLOBAL FINDINGS

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



# Critical Barriers to Progress



Contents lists available at [ScienceDirect](#)

European Journal of Operational Research

journal homepage: [www.elsevier.com/locate/ejor](http://www.elsevier.com/locate/ejor)

Innovative Applications of O.R.

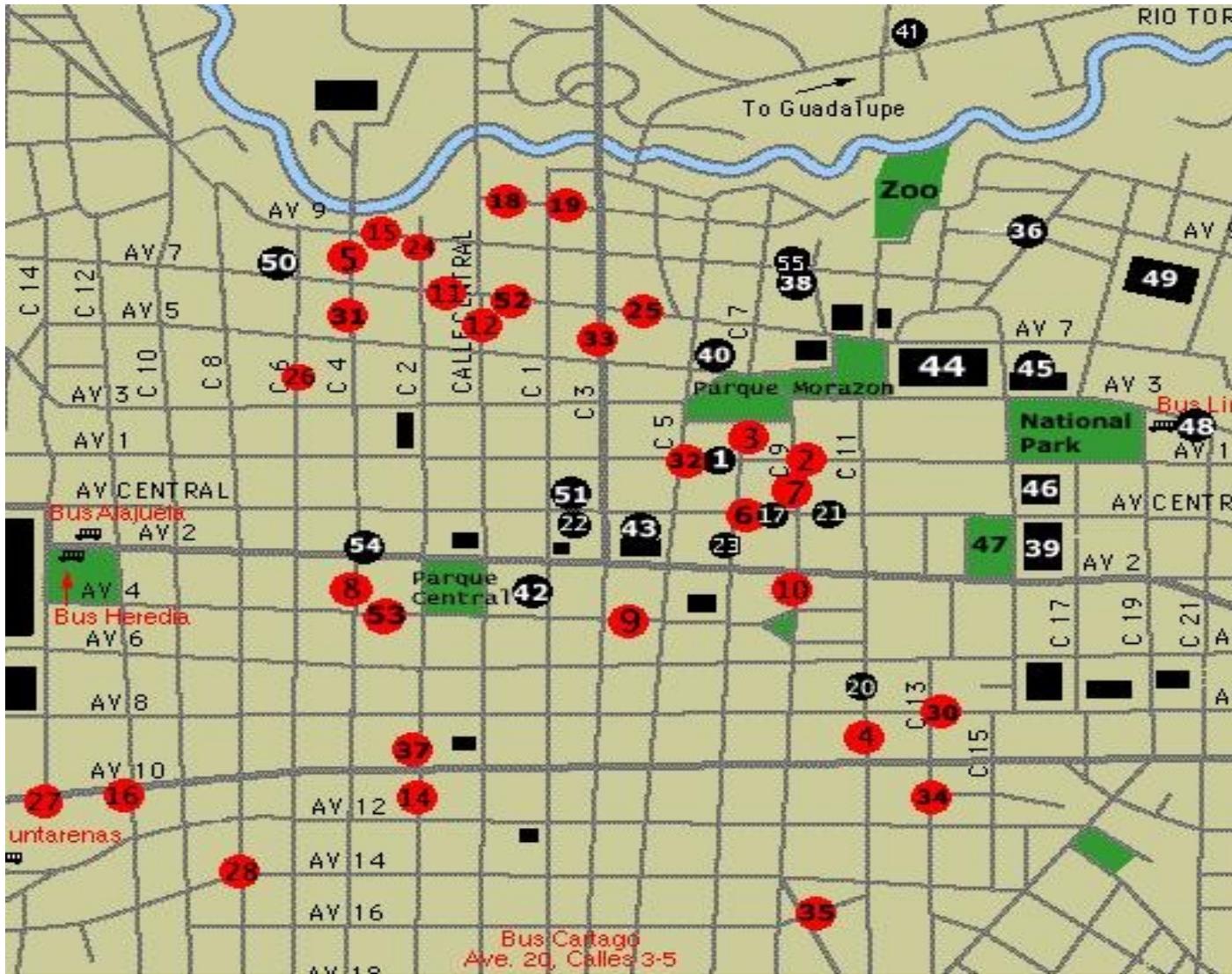
Overcoming human trafficking via operations research and analytics:  
Opportunities for methods, models, and applications

Renata A. Konrad<sup>a,1,\*</sup>, Andrew C. Trapp<sup>a</sup>, Timothy M. Palmbach<sup>b,c</sup>, Jeffrey S. Blom<sup>d</sup>

# 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



# Sex Tourism

14 years old: \$400 per session-  
“I’m Special



# Collection of Known Samples





# ANDE Rapid DNA Analysis System



**Sample  
Collection Swab**

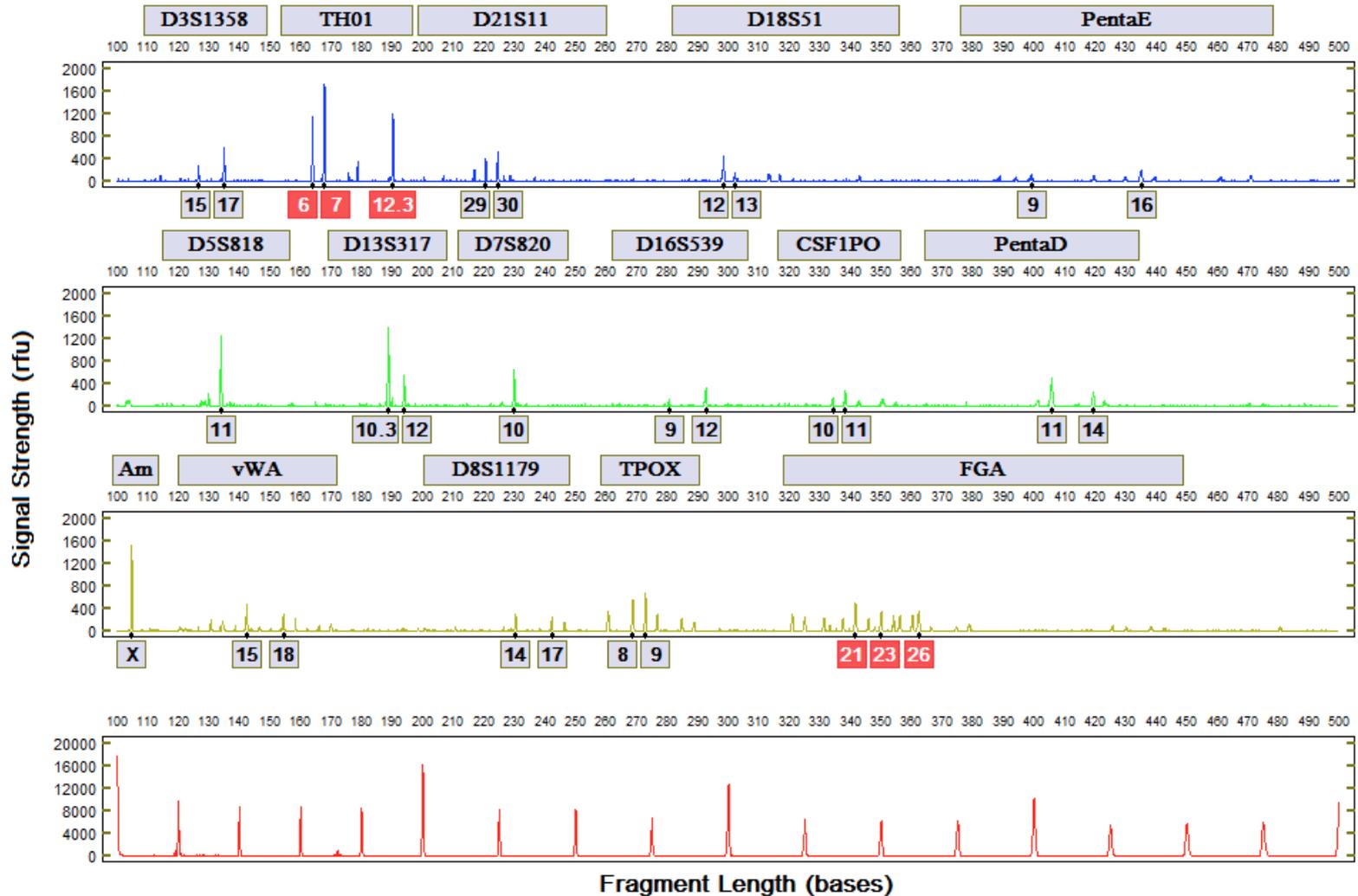


**BioChipSet™ Cassette**



**Fully Automated  
Instrument**

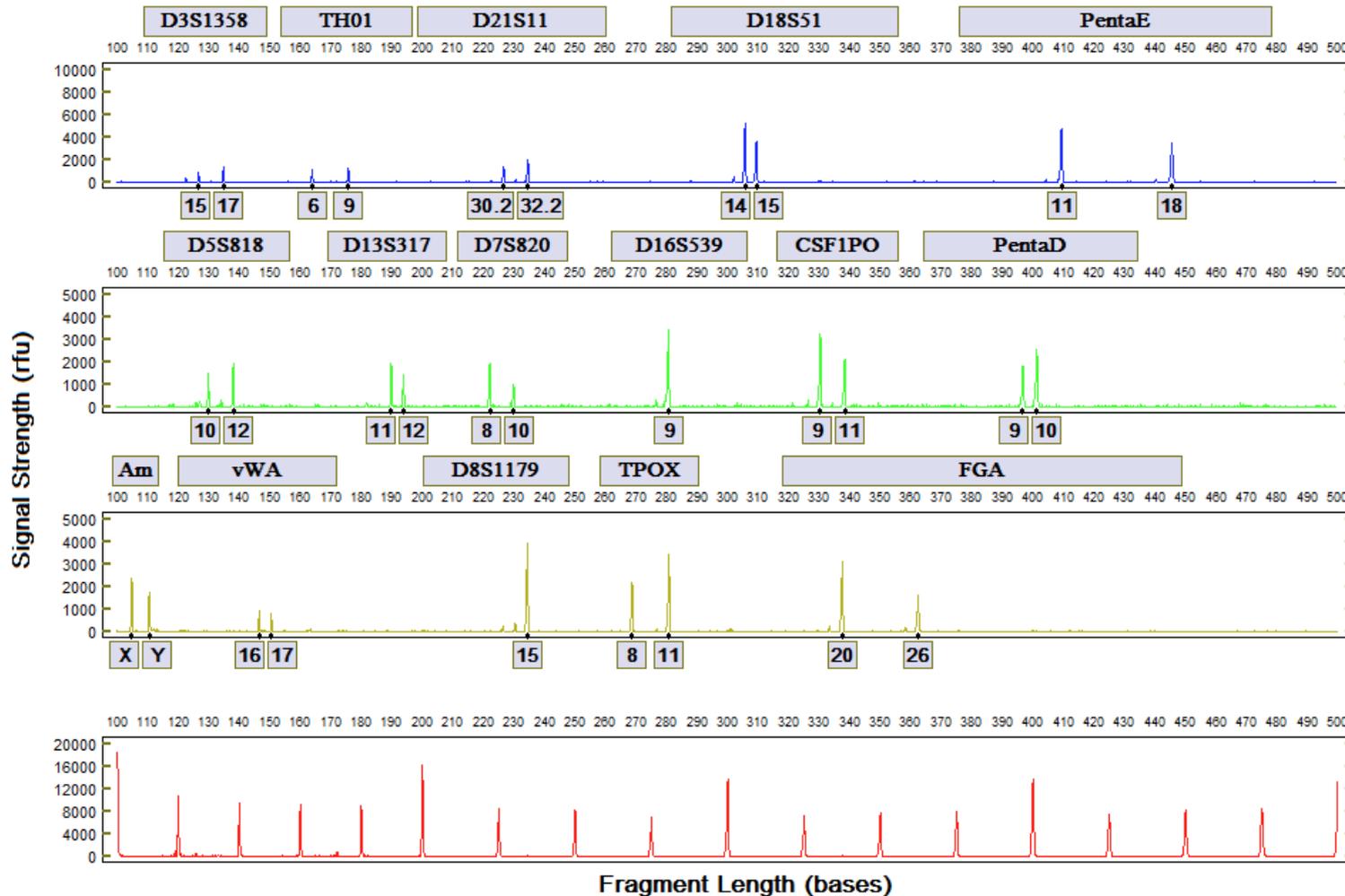
# Swab – Exterior Condom



# Swab from Drinking Glass

Allele Report R6942\_P7\_C130530\_GF130614.4\_sAL\_L03

10/18/2013 9:27 AM



# **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



# Study: Majority of people unable to spot fake passports

21 February 2017 17:37 GMT



[Jump to comments](#)

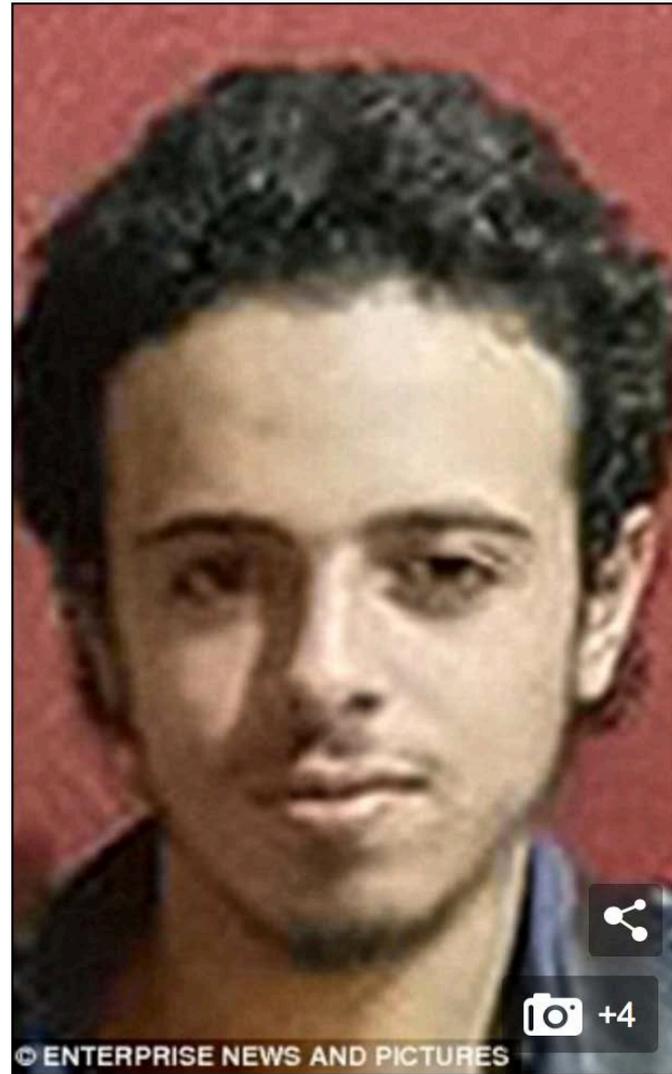
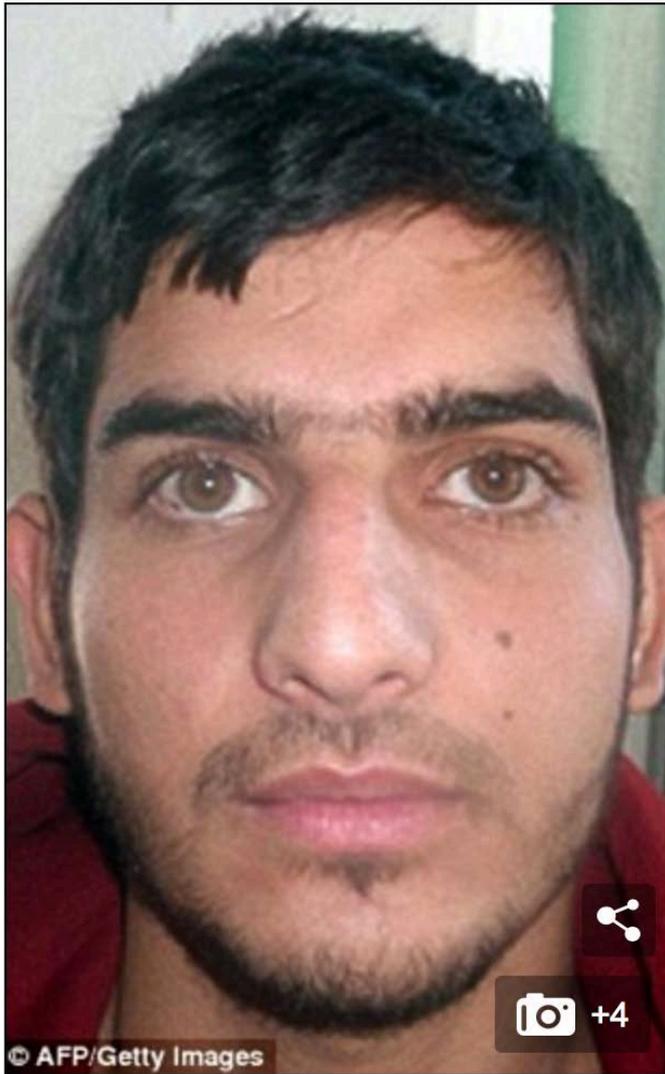


A biometric identity checking firm has found that most people are unable to spot forged passports in a new study.

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**



## Fingerprints & Other Biometrics

Select Language

Get FBI Updates

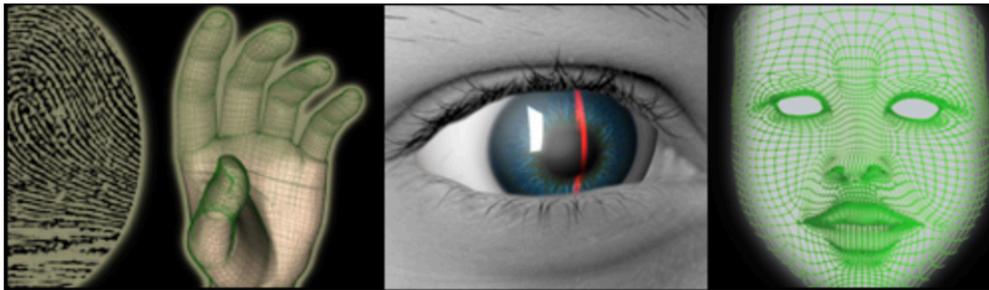
Home • About Us • CJIS • Fingerprints & Other Biometrics • NGI

### 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.

#### For More Information

- Repository for Individuals of Special Concern (RISC) | (pdf)
- Beyond Fingerprints: Our New Identification System
- FBI Biometric Center of Excellence
- FBI Biometric Specifications
- Biometric Knowledge Center/West Virginia University

# Case Study II: Nepal



06729

2012.09.29

05:13:01

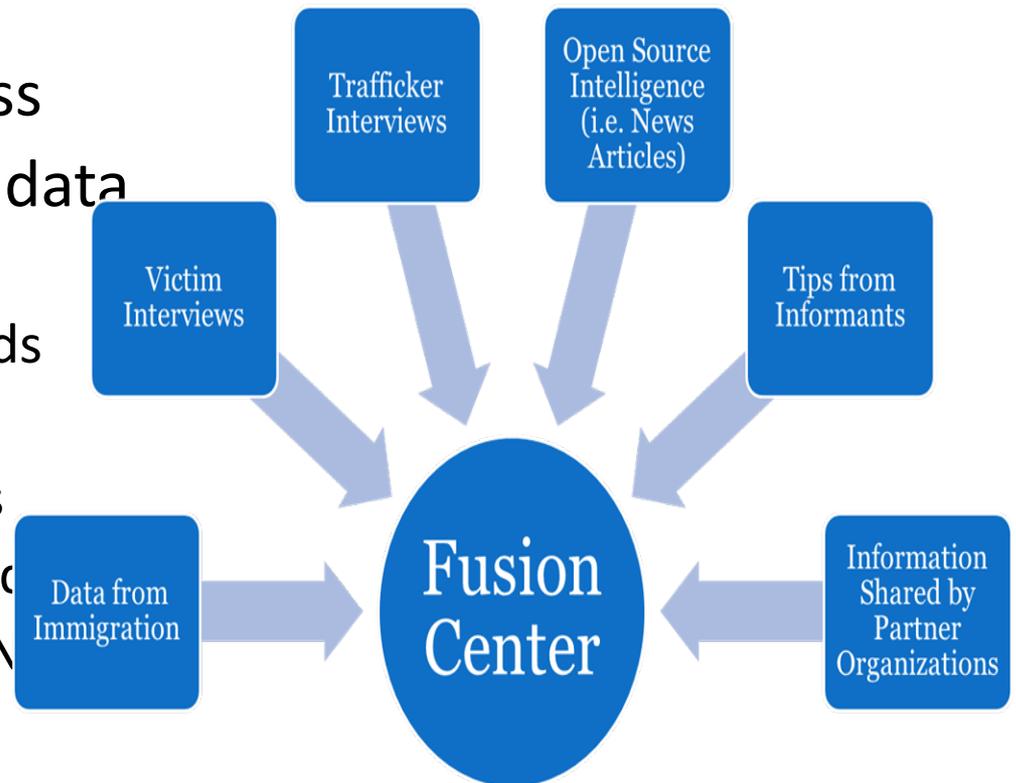


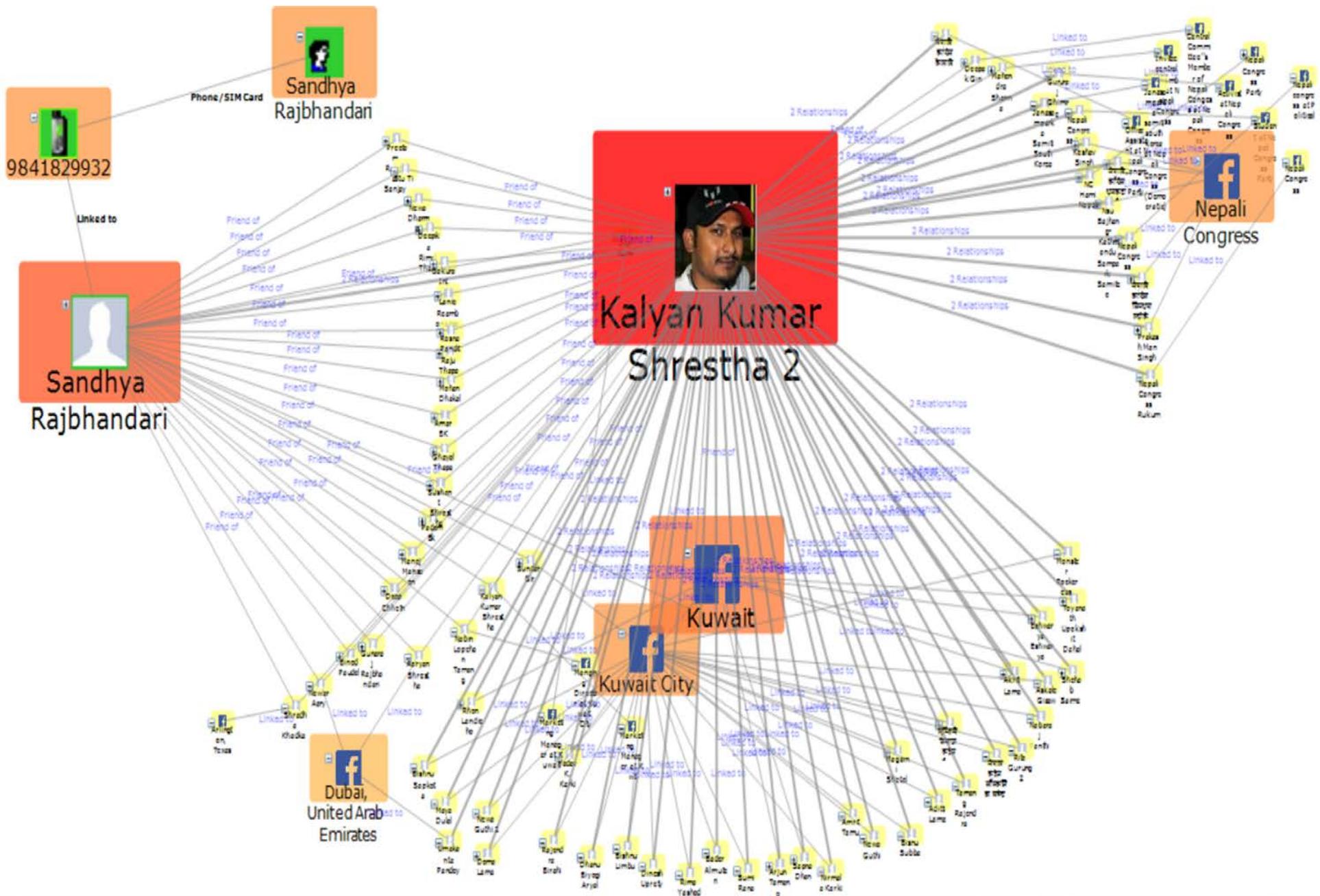
# Intelligence-Led Investigations

- **Data collection**

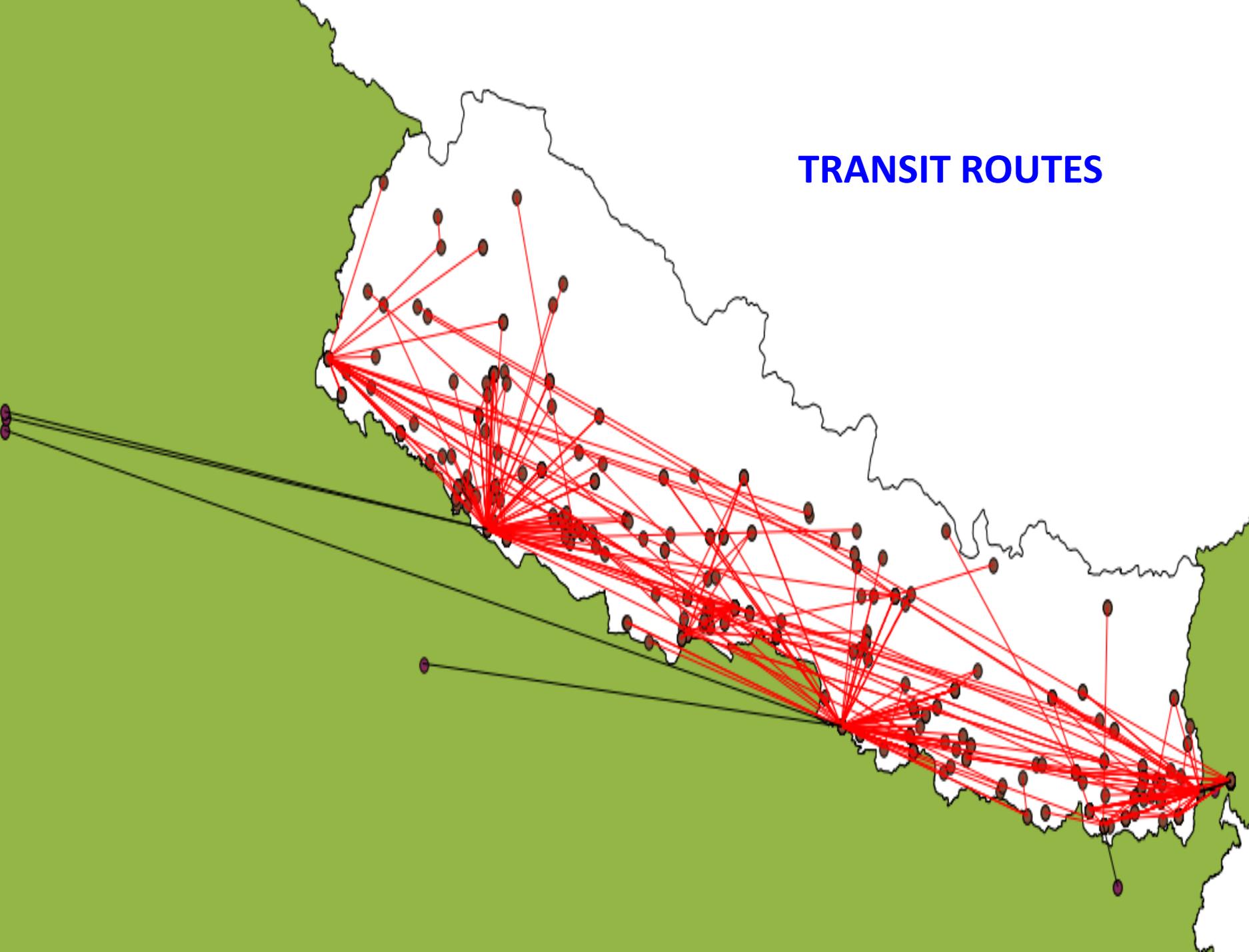
- Initiates the process
- Various sources of data

- Police Reports
- Immigration records
- Victim interviews
- Suspect interviews
- Open source records
- Information from M
- Tips
- Self-initiated





**TRANSIT ROUTES**



# 🌐 Border Monitoring





# Poland / Ukraine border



Placówka Straży Granicznej  
w Medyce



# 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**

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- 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**

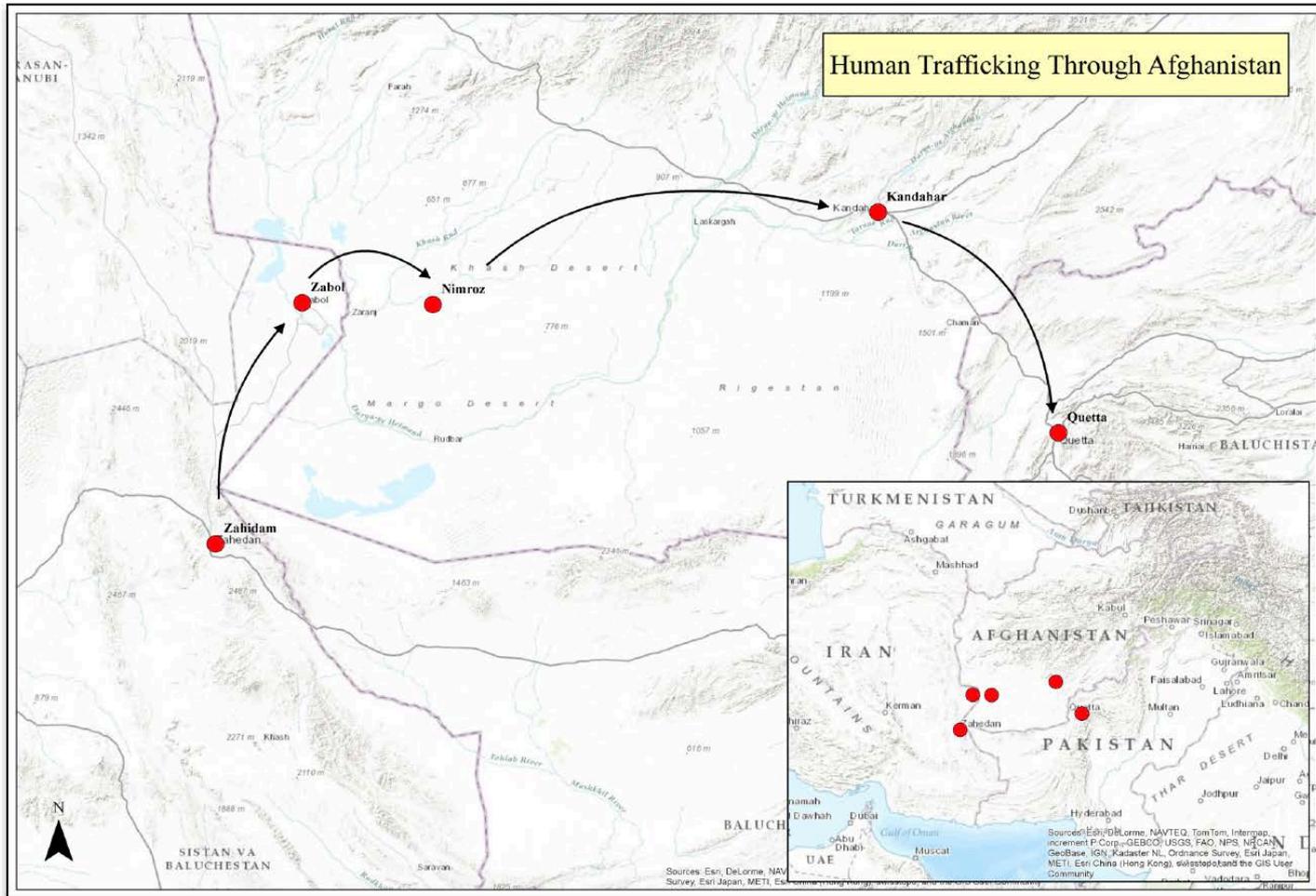
## **- DNA Database Challenges**

- **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



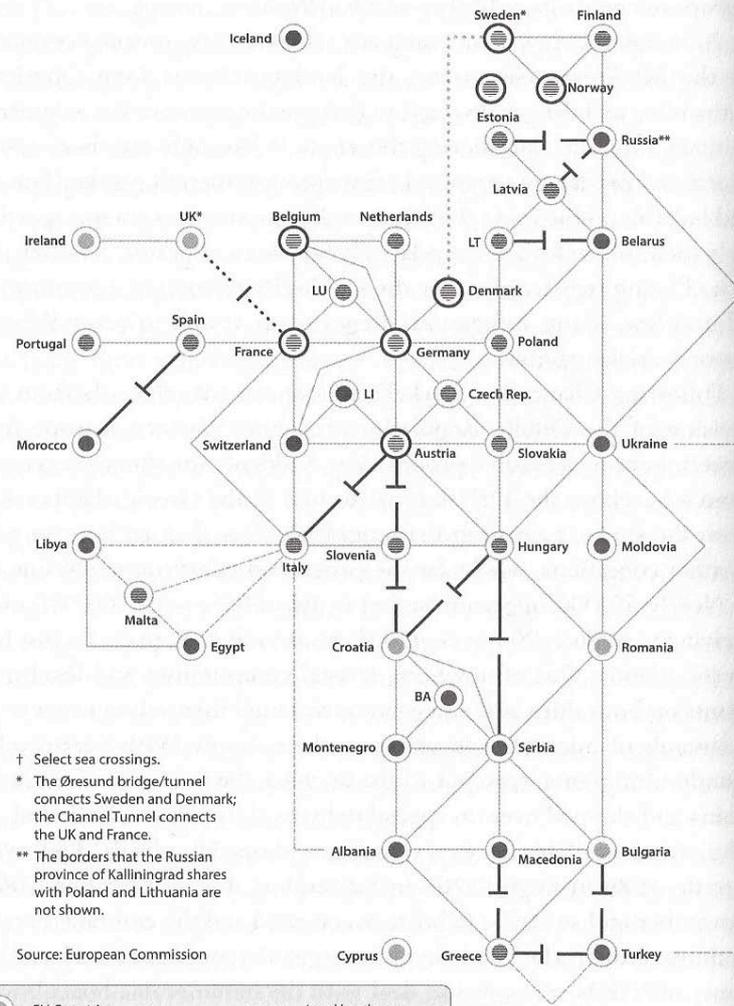
# ROUTES



“Migrant, Refugee, Smuggler, Saviour” Tinti and Reitano

Map 1: The principal migrant routes to Europe<sup>6</sup>

# MIGRANT, REFUGEE, SMUGGLER, SAVIOUR



† Select sea crossings.  
 \* The Øresund bridge/tunnel connects Sweden and Denmark; the Channel Tunnel connects the UK and France.  
 \*\* The borders that the Russian province of Kalliningrad shares with Poland and Lithuania are not shown.

Source: European Commission

	EU Countries		Land border
	Non-EU Countries		Sea crossing
	Schengen Countries		Tunnel/bridge
	Schengen zone frontier with border controls enforced		Border fence
			Tunnel/bridge fence

“Migrant, Refugee, Smuggler, Saviour” Tinti and Reitano

Map 3: The border controls of Europe<sup>23</sup>

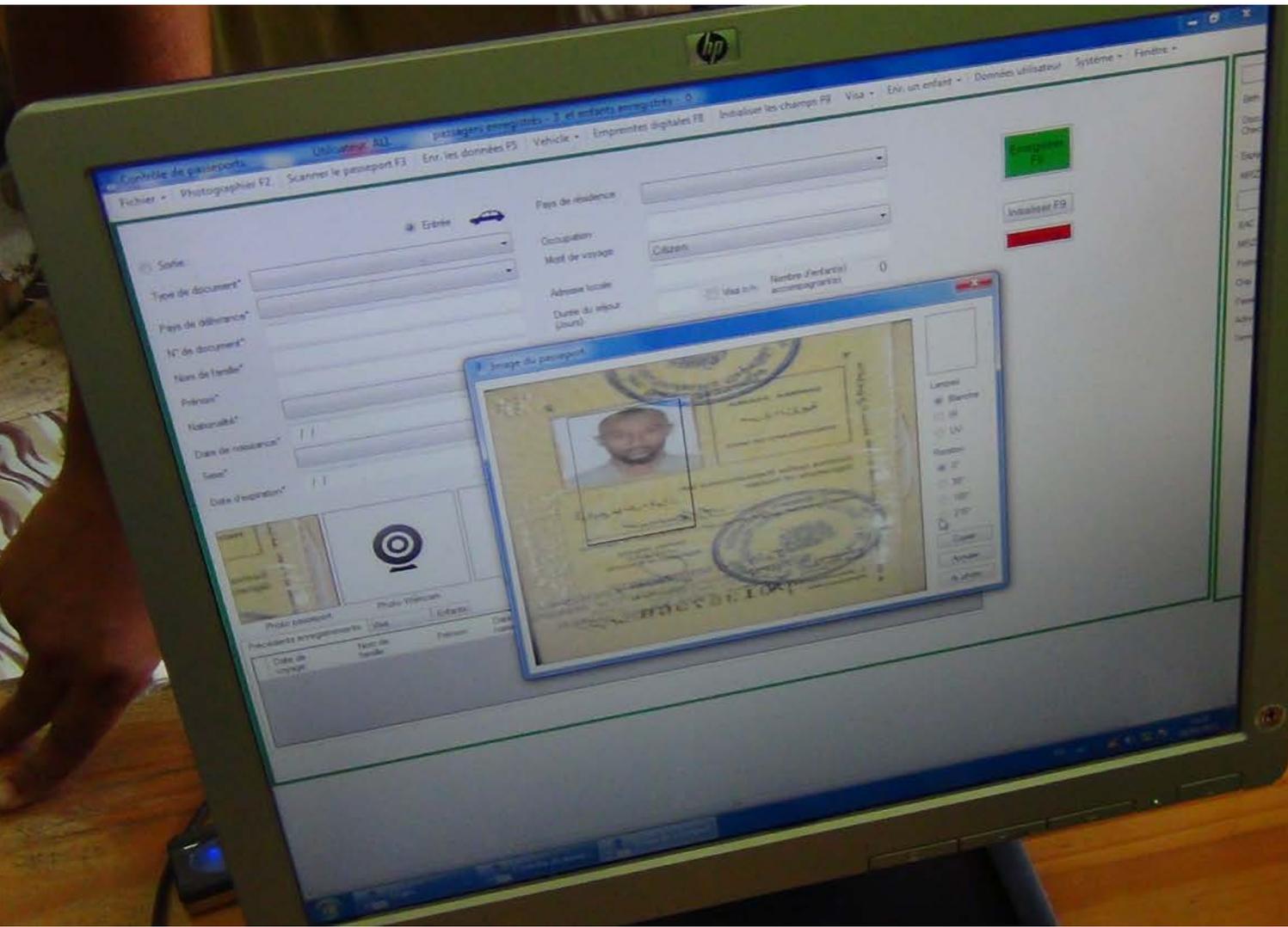


## East Africa – Refugees









Contrôle de passeports

UNILABEAP ALL | passages enregistrés - 2 et enfants enregistrés - 0 | Initialiser les champs F9 | Visa - Enfant un enfant - Données utilisateur | Système - Fenêtre -

Fichier - Photographier F2 - Scanner le passeport F3 - Entr. les données F5 - Véhicule - Empreintes digitales F8

Entrée

Type de document\*  
Pays de délivrance\*  
N° de document\*  
Nom de famille\*  
Prénoms\*  
Nationalité\*  
Date de naissance\*  
Sexe\*  
Date d'expiration\*

Pays de résidence\*  
Occupation\*  
Motif de voyage\*  
Adresse locale\*  
Durée du séjour (jours)\*  
Visa n°\*  
Nombre (enfants) accompagnants\* 0

Emregistrer F6  
Initialiser F9

Image du passeport

Photo du passeport

Photo Webcam

Précédents enregistrés: 0/0

Date de voyage

Type de voyage

Photo

Date

Annuler

Autres



digitalPersona



VAMPIRE™

## 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.

Contact Us

Support



# Performing Onsite, Real-Time Mobile Forensic Collection, Analysis, and Identification

**Terrorism  
Prevention**

**Human Trafficking &  
Migrant Smuggling**

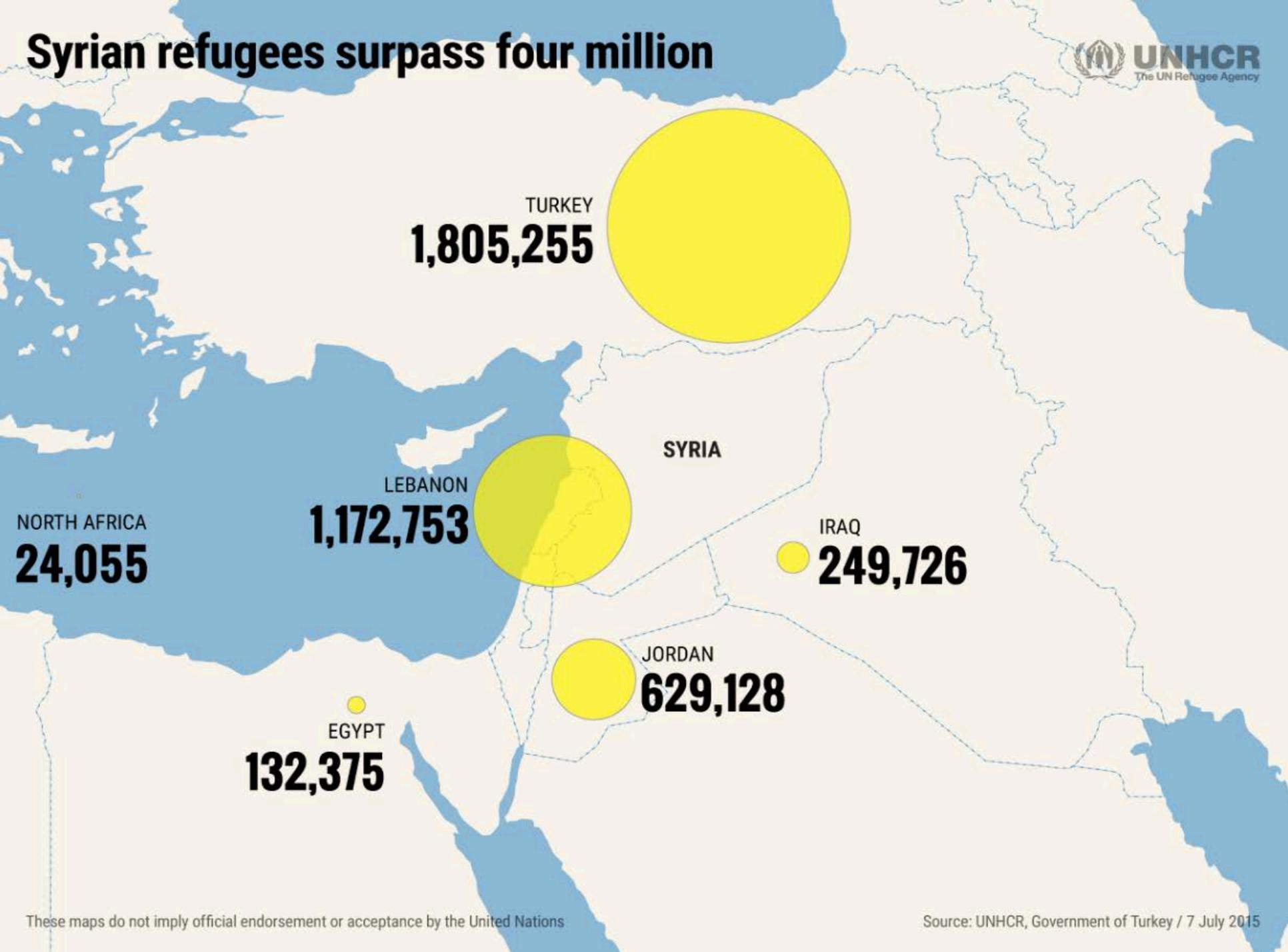


**Organized Crime**

**Crime Prevention &  
Criminal Justice**



# Syrian refugees surpass four million





Syrian refugees at the Zaatari refugee camp near Mafraq, Jordan, in Jan. 2013

Photo credit: Getty Images

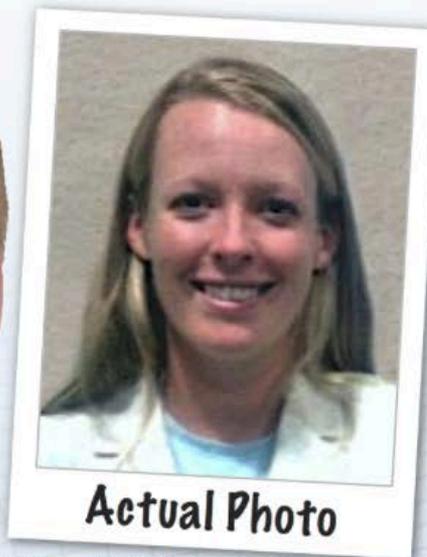
# **Victim Identification and Association to Illegal Activities, Suspects and Locations**

# Transportation of Victims



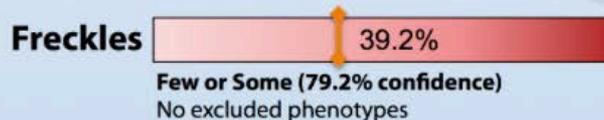
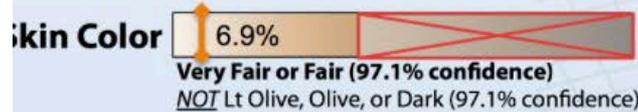
# Snapshot Prediction Results Composite Profile

Case #ELLEN-GREYAK  
PNL Reference #14L16AK46DM



Actual Photo

## Predicted (☑) & Excluded (☒) Phenotypes



**Sex:** Female  
**Ancestry:** 100% European  
(Northwest – British Isles)



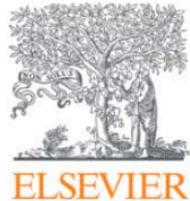
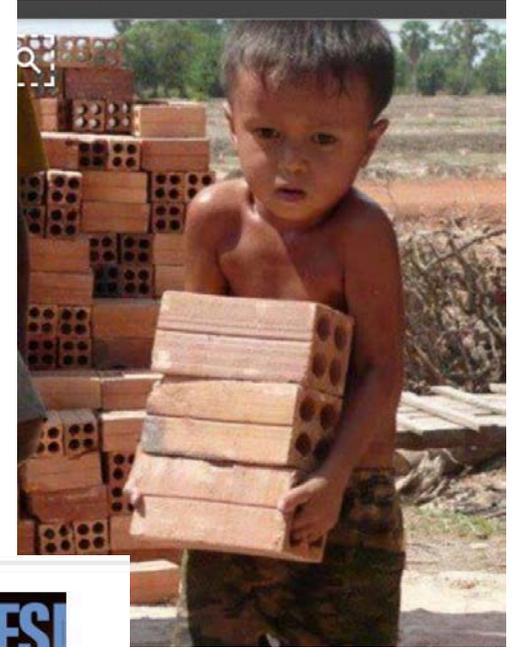
# Using Rapid DNA for DVI Mass Graves

By THOMAS FULLER MAY 4, 2015



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



Forensic Science International: Genetics

Volume 11, July 2014, Pages 117-125



Isolation and identification of age-related DNA methylation markers for forensic age-prediction

Shao Hua Yi, Long Chang Xu, Kun Mei, Rong Zhi Yang, Dai Xin Huang  

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<https://doi.org/10.1016/j.fsigen.2014.03.006>

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# Thank you and Questions?

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