

# Missed Detections: From Data to Actionable Estimates

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## Problem Statement

What methods can determine missed detections (of undocumented migrants, drugs, other contraband, etc.); inform decisions about countering illegal flows; and enable accurate measures of illegal flow volumes?

## Project beneficiaries and end users

Decision-makers at national level need numbers for all illegal activities; all borders; all modes of access (plane, vehicle, etc.). Decision-makers and operational managers need to know the trends in threats, and the trends in their own performance, to manage effectively.

## GAINS desired

More accurate estimation of undetected illegal flows  
Assessment of factor impact on reducing those flows

## PAINS at present

Very hard for the nation to track progress on securing borders

## Project products & services

In process: TRENDFLAGGER Smart Spreadsheet Tool

Under development: Principal Ray Finder to Estimate Flows

To be developed: Methods to Synthesize Realistic Data

To be developed: Extended Capture Recapture (ECR) Estimator

To be developed: Data Envelopment Factor Analyzer

## GAINS created

No transitions yet

## PAINS alleviated

No transitions yet

## Key Accomplishments:

Kickoff meeting with champion and Agency representatives

Initial Development of Trend Flagger Spreadsheet Tool

Mathematical formulation of Principal Ray Finder

Planning list of factors affecting the ECR model

## Next Steps:

Work with headquarters researchers to define

(1) Available variables from the factor list for ECR

(2) Methods to develop non-sensitive data that support realistic analysis

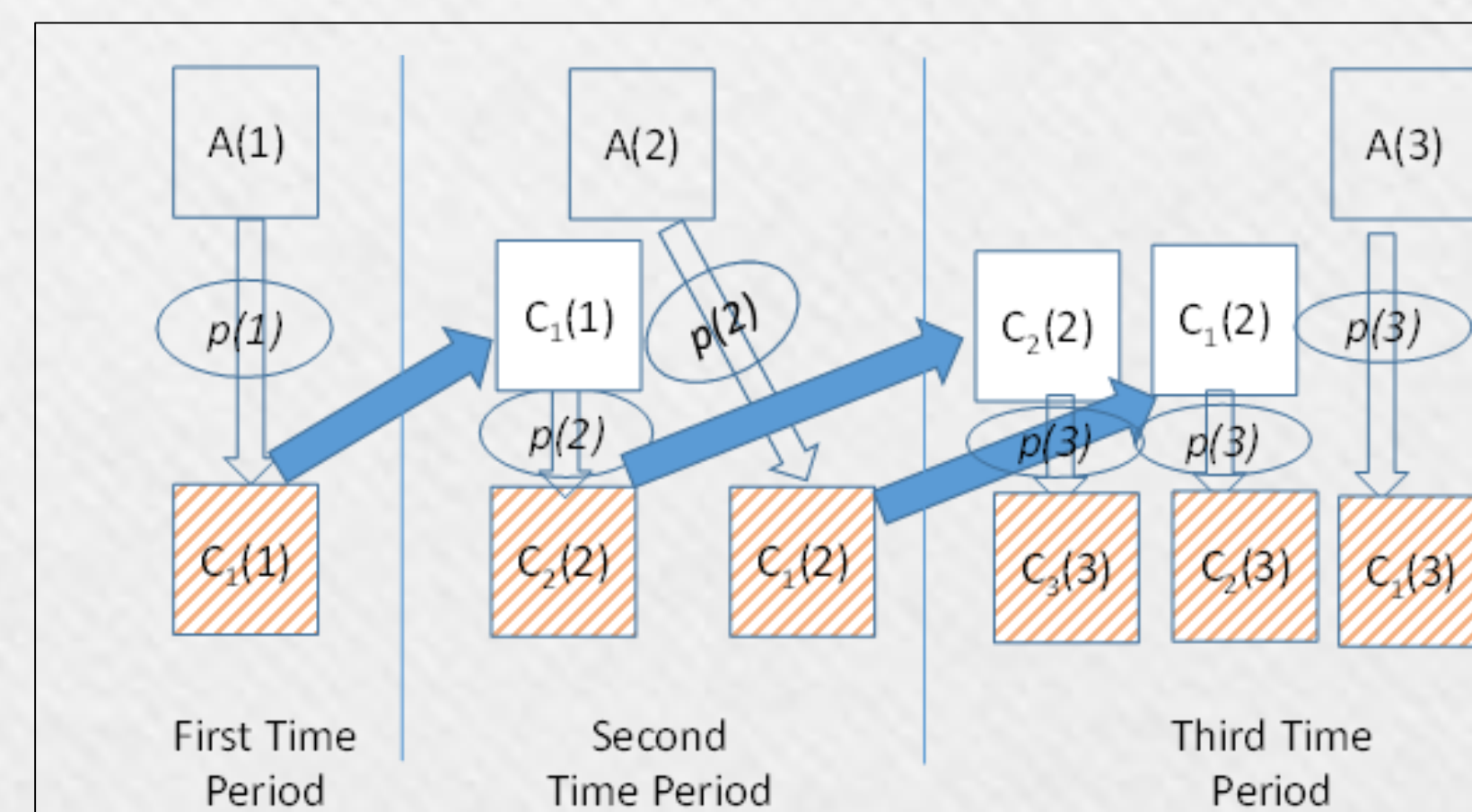


Figure 1. The Simplified Extended Capture-Recapture

	APPS	PLI_LIIMS	IRMSIS	IBR	PLI_MAR	AWPS	NALS	ASDAULTS	Travel Data	Column
UpTrend	60	10%	10%	10%	10%	20.00	1%	3	1	
DownTrend	60	5%	5%	5%	5%	20.00	1%	3	1	
AveragingWindow	4	3	3	4	4	4	4	5	3	
Cor.Month	1	710	0.21	0.48	0.61	0.64	314			
7.10	2	608	0.23	0.5	0.57	0.64	364			
7.11	3	389	0.22	0.44	0.59	0.68	305			
7.12	4	865	0.2	0.5	0.67	0.59	282			
8.01	5	1200	0.22	0.52	0.68	0.58	329			
8.02	6	1460	0.21	0.54	0.7	0.5	337			
8.03	7	1506	0.22	0.53	0.7	0.51	337			24
8.04	8	1056	0.24	0.51	0.69	0.56	346			23
8.05	9	805	0.26	0.49	0.68	0.5	275			24
8.06	10	675	0.32	0.48	0.76	0.46	311			25
8.07	11	591	0.36	0.48	0.75	0.54	344			28
8.08	12	603	0.36	0.51	0.75	0.54	358			19
8.09	13	599	0.38	0.47	0.68	0.42	285			19
8.10	14	425	0.36	0.43	0.61	0.45	316			18
8.11	15	320	0.3	0.43	0.63	0.58	308			26
8.12	16	610	0.27	0.46	0.66	0.51	271			26
9.01	17	790	0.23	0.48	0.68	0.55	299			23
9.02	18	1090	0.28	0.52	0.71	0.58	286			23
9.03	19	943	0.27	0.53	0.72	0.53	295			33
9.04	20	780	0.31	0.51	0.71	0.62	282			18
9.05	21	707	0.29	0.5	0.75	0.56	300			20
9.06	22	653	0.33	0.49	0.8	0.56	274			24
9.07	23	674	0.32	0.52	0.84	0.62	261			37
9.08	24	510	0.37	0.51	0.78	0.51	216			39
9.09										

The ECR probabilities (above) depend on the interaction between demographics and experiences

The Trend Flagger (right) can provide visual alert when any particular data element is trending up or down too fast

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