



IVCC

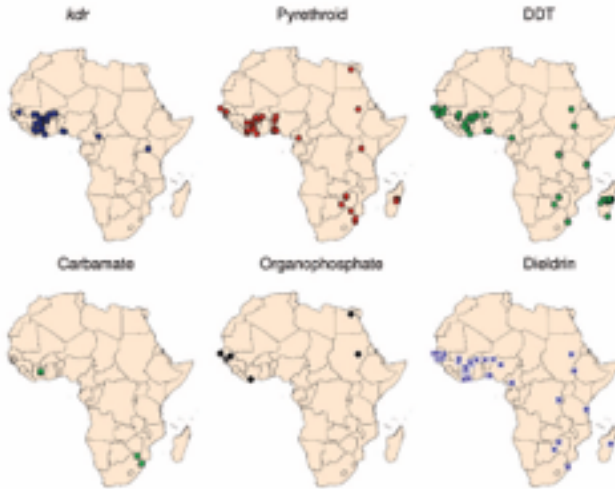
**COMBATING INSECT
BORNE DISEASE**

The Innovative Vector
Control Consortium

**The New Public Health
Pesticides Pipeline May 2009**

**Tom McLean
IVCC Snr Executive Officer**

The Insecticide Resistance Time Bomb !

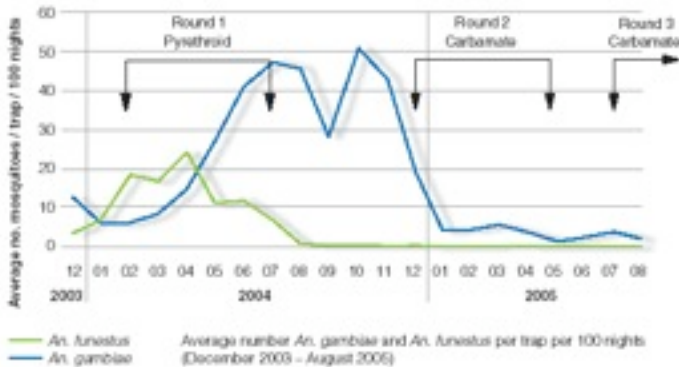


- Growing observation of insecticide resistance in Vector Mosquitoes.
- The Data is Incomplete !!
- Are we mapping resistance or entomologists ?

Major biochemical mechanisms of resistance

| | Metabolic | | | Target-site | |
|------------------|-----------|---------------|-------------------|-------------|------|
| | Esterase | Monooxygenase | GSH-S-Transferase | kdr | MACE |
| Pyrethroids | • | •• | | •• | |
| DDT | | • | •• | •• | |
| Carbamates | • | | | | •• |
| Organophosphates | •• | • | | | •• |

- Only 4 Classes of Insecticide approved for Malaria vector control, Only 1 for nets.
- Resistance is known for all these insecticides !



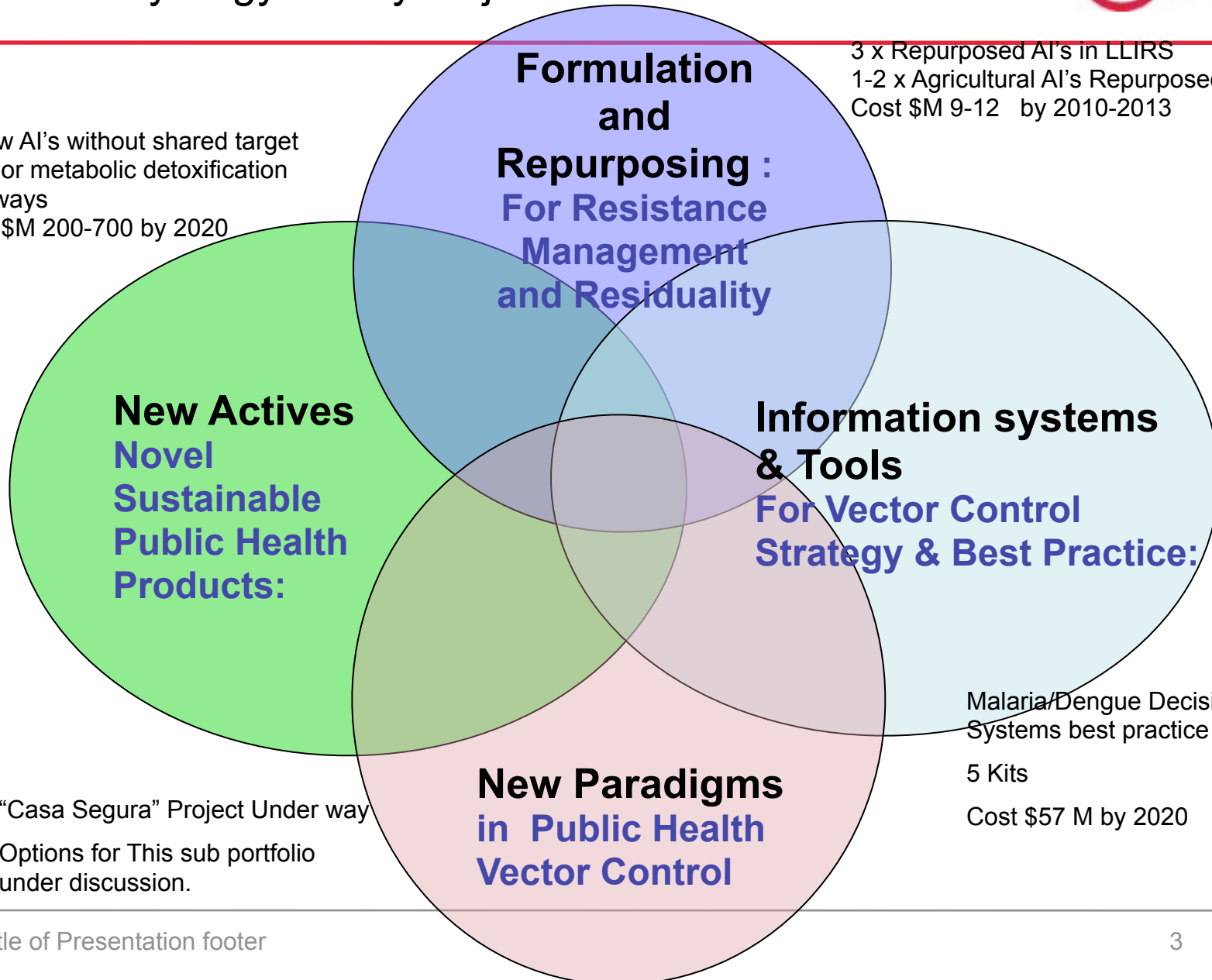
- **Effective Disease control and eventually elimination requires :-**
- **New and Better insecticides to overcome resistance.**
- **Information about mosquito populations and disease epidemiology**

The Ideal Portfolio; Synergy of Key Objectives



3 New AI's without shared target sites or metabolic detoxification pathways
Cost \$M 200-700 by 2020

3 x Repurposed AI's in LLIRS
1-2 x Agricultural AI's Repurposed in LLIN
Cost \$M 9-12 by 2010-2013



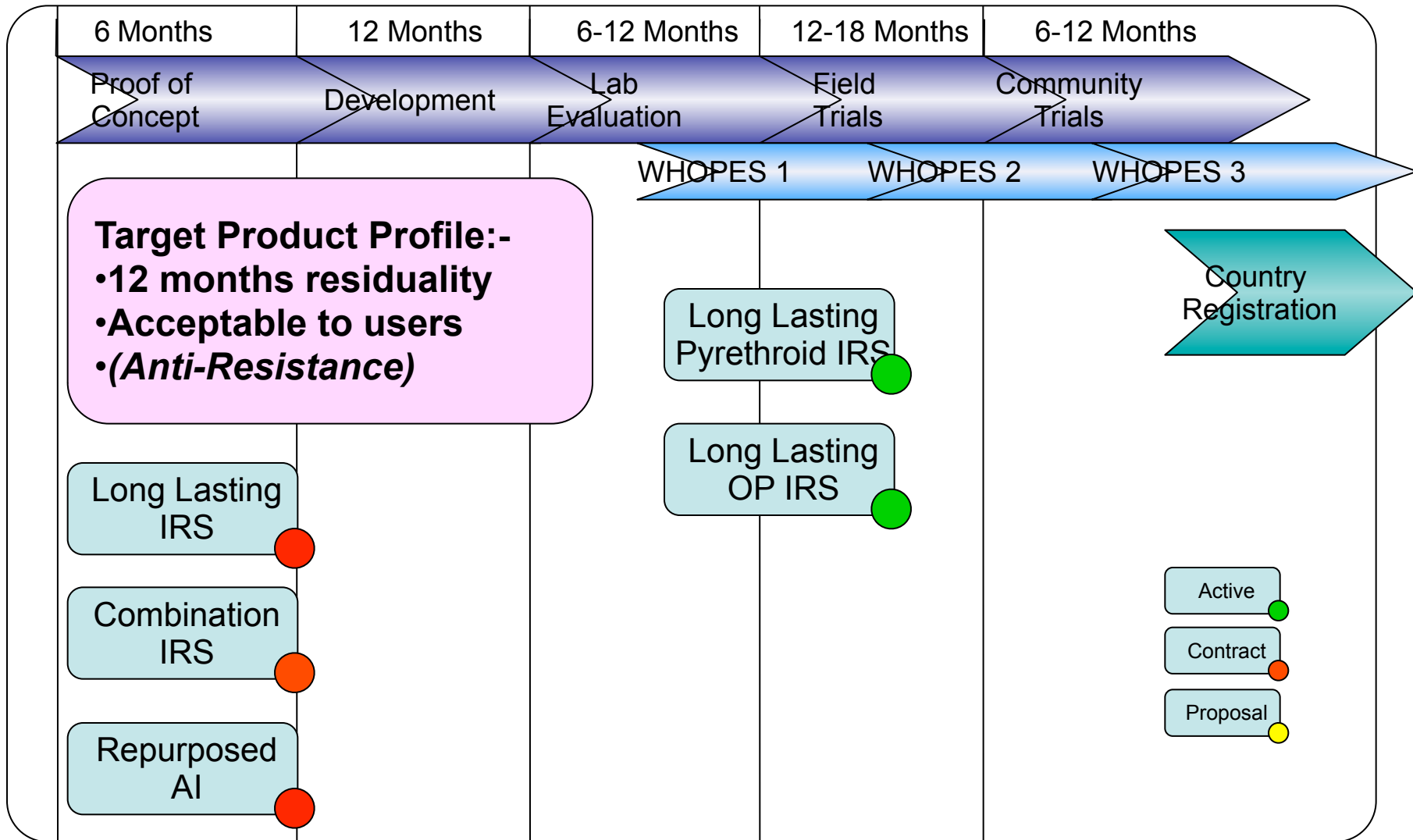
Malaria/Dengue Decision Support Systems best practice disseminated.

5 Kits

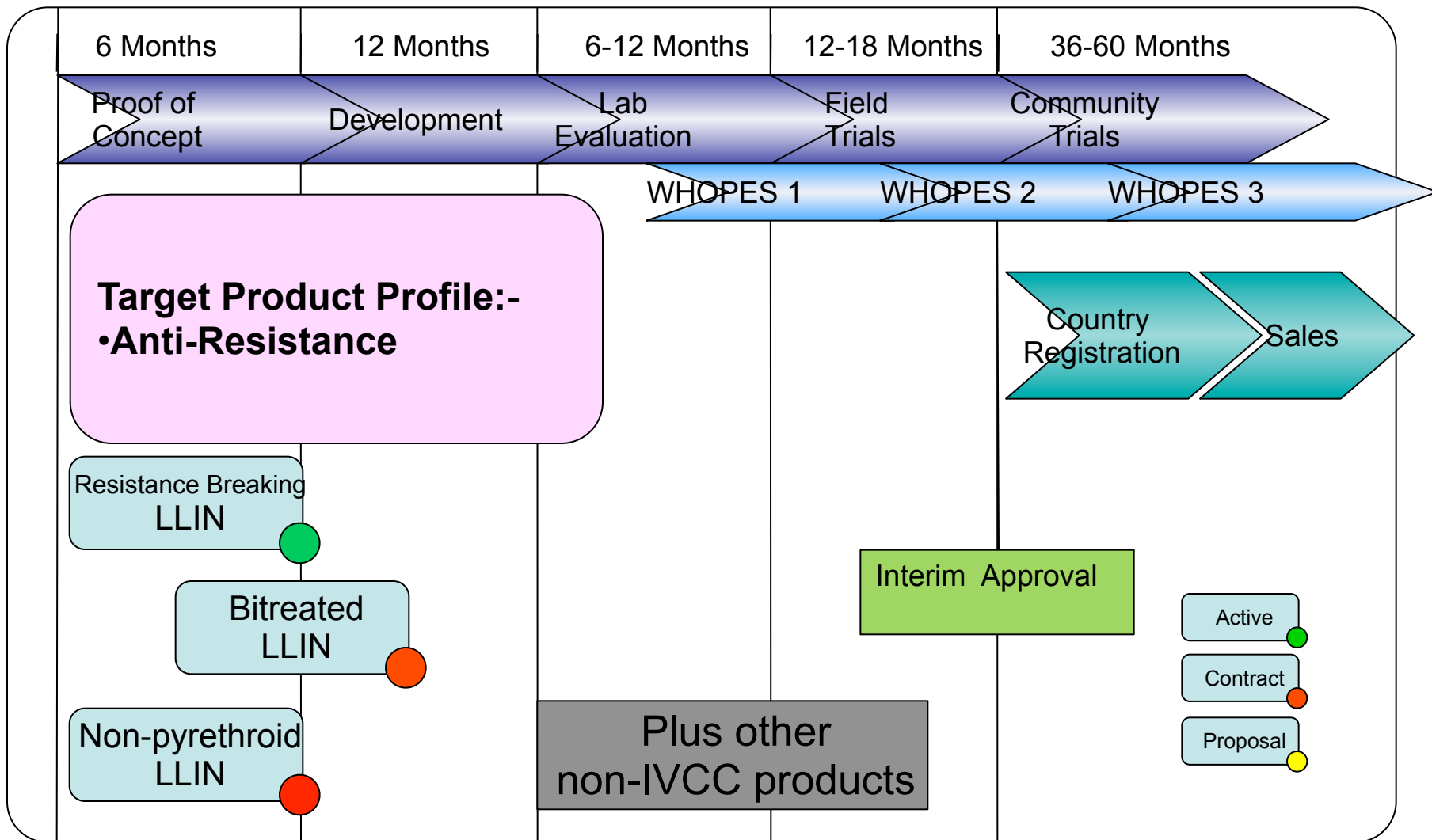
Cost \$57 M by 2020

“Casa Segura” Project Under way
Options for This sub portfolio under discussion.

IVCC Indoor Residual Spray Pipeline

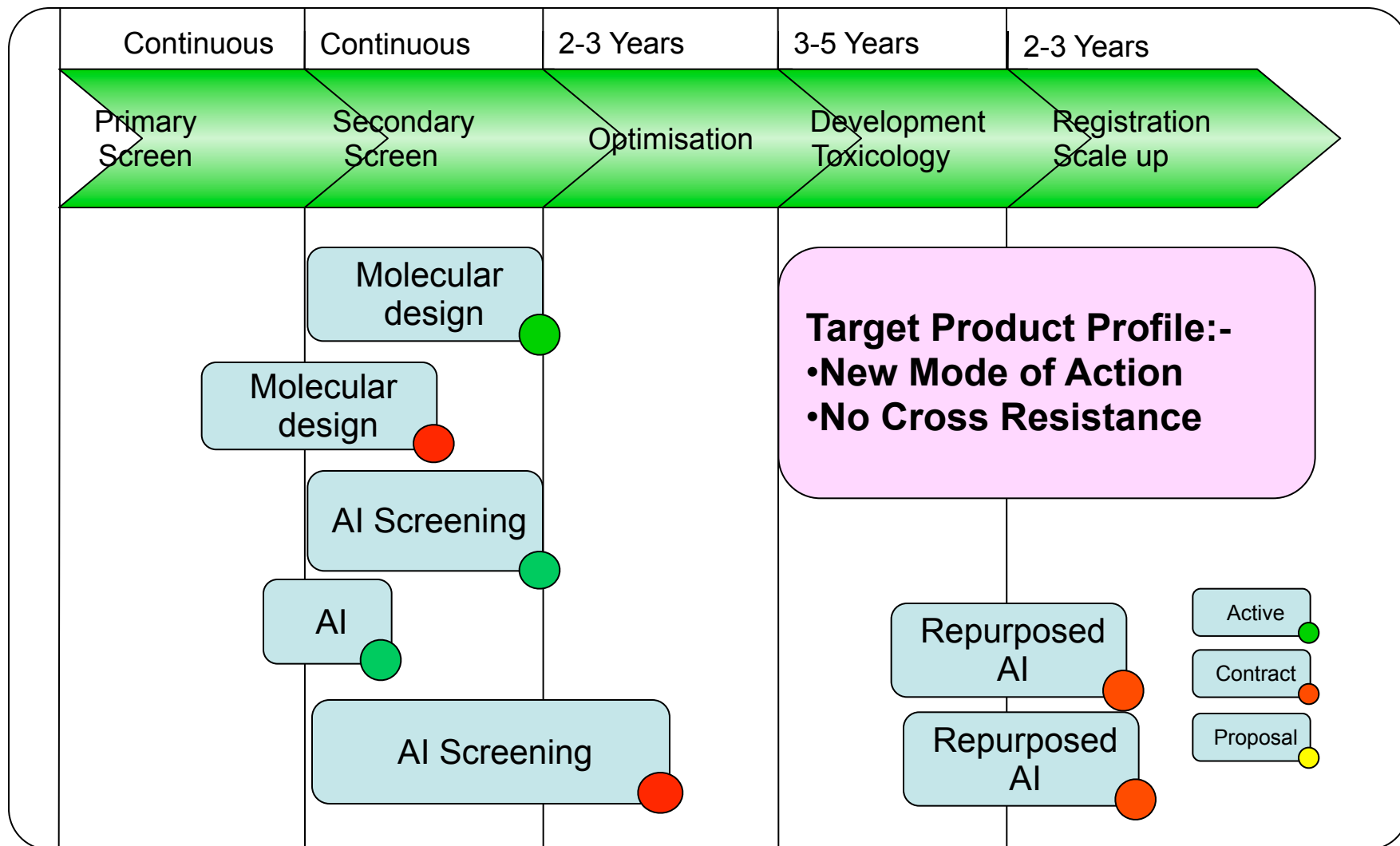


The Long Lasting Nets Pipeline



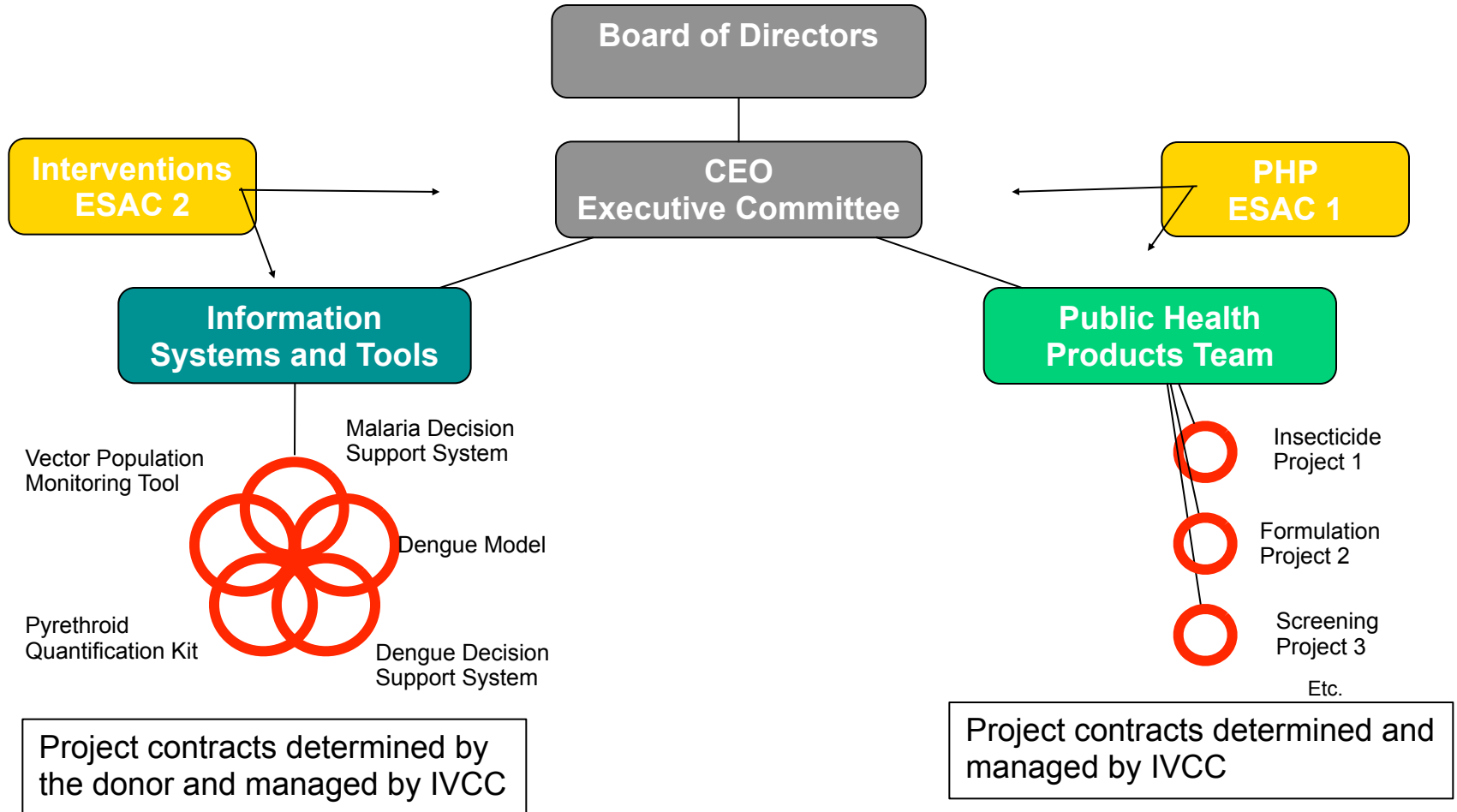
- **New formulations and products coming in the pipeline will stretch the existing registration systems.**
- **Current registration systems are designed to fit known conventional patterns of action, and may reject innovative products.**
- **Need systems that will recognise Alternative killing mechanisms**
 - Anti-feedants, Growth regulators, etc
- **Need mechanisms to assess resistance breaking.**
- **Need mechanisms to assess New Paradigms in vector control**
 - Eg consumer products

IVCC New Active ingredient Pipeline



- **Historically all Public Health Pesticide AIs have come from agriculture.**
- **Next generation of Public Health AIs may be PHP only!**
- **What is the appropriate registration mechanism ?**
 - Via EPA and EU 91/414 or direct to country
- **What is the required dossier and authority ?**
 - Like agriculture or like Biocide ?
- **Can we speed introduction with a “prequalification process” cf malaria drugs.**

IVCC Develops Information tools as well as insecticides



Decision Support Data Collection and Databases



Courtesy Brian Sharp



New DNA tools and Kits for mass entomological data creation !

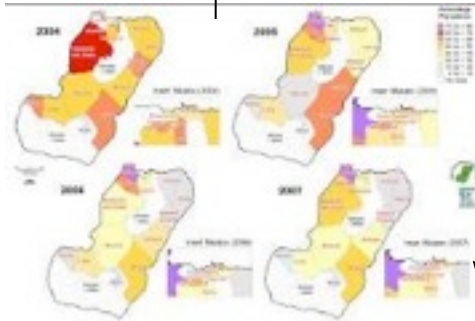


Entomology
Abundance

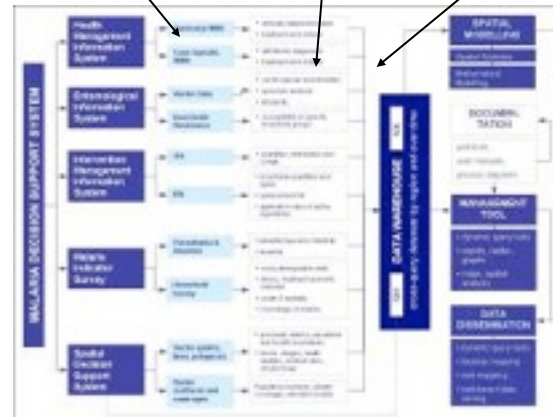
Species
Infection
Resistance

Parasitemia
MIS survey

Intervention
Data



Output is graphs /tables and maps to support the local NMCP + Standardised data format for regional analysis



Innovation in Chemistry and Paradigm are linked



| | Public Health Product | Intervention Paradigm |
|--------|---------------------------|--------------------------|
| 1940's | DDT | Hudson Sprayer |
| 1950's | Organophos phates | |
| 1960's | Organophos phates | |
| 1970's | Carbamates Pyrethroids | |
| 1980's | Pyrethroids | Insecticide Treated Nets |
| 1990's | | |
| 2000's | | |
| 2010's | Need For New AI | Need For New Paradigm |

